Recent Developments in Massage.

By Douglas Graham, M. D.

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RECENT DEVELOPMENTS

IN

MASSAGE

HISTORICAL, PHYSIOLOGICAL, MEDICAL AND SURGICAL.

BY

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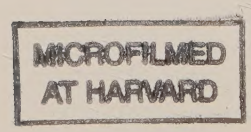

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PREFACE.

The title of this brief work sufficiently indicates its character. It is not intended for a complete text-book of Massage, but is mainly supplementary to my Treatise on Massage which was issued in 1890.

No apology can be offered for the incongruity of subjects grouped together in some of the chapters, other than that of convenience, and that a reader likes to know that he has finished a chapter and passed another milestone toward the end of his journey.

The mere fact that massage is mentioned in the treatment of certain diseases in the Contents of the Chapters, is no sign of its approval or condemnation. But if reviewers will take the trouble to read what is written anent the same (which few of them ever do), they will see what is said.

Those who are interested in massage will find it a great convenience to have all these items in one handy little volume, and for one I feel indebted to the publisher for having undertaken this task.

Hotel Pelham, Boston, Mass., May 2, 1893.

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MASSAGE.

CHAPTER I.

HISTORICAL.

HISTORICAL facts of great interest are often lost sight of when they would be most appropriate. Such has been the fate of the following until quite recently: Mary, Queen of Scots, was stricken down Oct. 17, 1566, with a malignant intermittent typhus fever, supposed to have been caused by fatigue and also by annoyance at the conduct of her wretched husband, Darnley. She was very ill and sank rapidly, and, becoming convinced that her last hour had come, she calmly prepared for death. She forgave all who had offended her, and asked pardon of all whom she had aggrieved. She became cold and rigid; her form straightened out; her pulse and respiration were no longer perceptible. All despaired of her save her physician, News, who, hoping against hope, continued to use vigorous friction, and at length succeeded in restoring her to life. This was the crisis of her fever, and she then began rapidly to improve. Her death, meantime, had been reported in Edinburgh.* Many

* "Life of Mary, Queen of Scots," by Donald MacLeod.

times afterwards, no doubt, she wished she had died then, as it would have saved her a vast amount of trouble and an ignominious death.

Clement VIII., one of the greatest Popes that the church has ever had, was a great sufferer from gout in his hands and feet. His friend Saint Philip Neri was very fond of him and visited him often, but was frequently prevented from doing so by illness. It was about Easter, 1595, that the Pope had an unusually severe attack and was ordered by his physician to keep in bed. Philip, hearing of this, desired to relieve him. He first prayed for the Pope, and then went to see him. When he came into the room the Pope was in so much pain that he could not bear any one to touch the bed. But Philip moved gently towards him, and the Pope entreated again that no one should touch him. With a smile of affectionate sympathy, Philip replied: "I am not sorry for the gout, Holy Father, for that compels you to rest; but I am sorry for the pain you suffer. Have no fear, let me do as I please." Without another word he seized a suffering hand and pressed it closely with great affection. The pain disappeared, and the Pope cried out: 'Go on touching me, Father; it gives me the greatest relief." The Pope was thus healed, so it is said. He afterwards spoke of it as a miracle to the cardinals for examining bishops, and often adduced it in proof of Philip's sanctity. *From that time forward, and even after Philip's death, whenever the Pope was suffering*

*from gout he commended himself to Philip, and the pain was at once relieved.**

It was probably rheumatic gout that the Pope had. An agreeable hand for massage is not always found in those in robust health, but frequently the reverse, as shown by Saint Philip. The Pope should have commended himself to his Heavenly Father for relief. If he did, it evidently had less effect than commending himself to Saint Philip.* That the Pope's faith in Saint Philip was sufficient to relieve him after the death of the saint, is an instance of auto-suggestion surpassing all the mind cures and faith cures and "Christian Science" of the present day, for they require a living or active agent through which to work on their patients or willing dupes.

Dr. C. F. Nichols, who has spent much time in the Sandwich Islands, thus describes a scene that he witnessed in church while there:

"Directly below the preacher two old women are seated sideways, confronting each other, their arms firmly clasping the knees, and each *smoking a pipe;* as they smoke they nod and yawn. Throughout the congregation loud snores are occasionally heard. Two little boys behind the preacher's desk skirmish

* The Roman Catholic Church makes saints of those only who can work miracles after their death. Therefore, in order to obtain canonization their friends must furnish proof that they are "great guns" and have much influence with the Almighty.

with umbrellas; one of the boys is driven to the wall. The father of the defeated, showing spirited sense of propriety, comes from the body of the church and roughly drives away the boy who has discomfited his child. Young men and women walk down the aisles, or step over the backs of seats to get drinks—sometimes returning with a mug or calabash of water for a friend. Enforcingly, the building has an echo of no small social power. A horse thrusts his head through an open window and looks quietly upon the audience.

"However, in spite of these interruptions, the main portion of the large assemblage seems undisturbed. These crude people are acting at ease. The mother with four children produces a rattle as a *dernier ressort* to quiet the baby. *An old woman is seized with a headache; she loosens her hair and signals a friend, who crosses to her in a bee-line, bestriding the backs of the seats, and* KNEADS THE MUSCLES OF HER HEAD IN NATIVE FASHION (*lomi lomi*), while *Keliokamaka*, her husband, never removes his eyes from the preacher's face. *Keliokamaka* is 85 years old; he owns little but a gray umbrella, a faded coat, and a white beard braided in two coils."

CHAPTER II.

PHYSIOLOGICAL EFFECT OF MASSAGE UPON THE MUSCLES.

The relations of massage to exercise, fatigue, and over-fatigue are too extensive for me to do more than briefly touch upon them here. Fatigue is an indication that waste is greater than repair. There is the same relation between moderate or normal fatigue and over-fatigue that there is between hunger and starvation. The condition of our muscles determines to a remarkable extent our feelings of health and vigor, or of feebleness and weariness. There is a muscular sense which is different from the sensation on the exterior of our bodies, as most people know who have felt the delightful effects of deep massage when fatigued. Exercise will not take the place of massage except in healthy people with an abundance of latent energy. Muscular fatigue from over-exertion or want of exercise is relieved by massage, which promotes more rapid absorption of effete materials and stimulates the tardy peripheral circulation upon which weariness to a large extent depends; thus showing a marked difference between the effects of exercise and those of massage. Fatigue from severe mental effort can be relieved by the same means, which increases the area and quantity of the circulation in

the external tissues of the body and thus depletes the overfilled cerebral vessels.

There are all degrees of fatigue, from simple healthy lassitude to typhoid states. In the febrile state from overwork, albumen may be present in the urine. Reveilliod has shown that under the influence of overwork (*surmenage*) the system becomes impregnated with extractive substances, elementary matters from which urea is formed. These substances are toxic and irritating, and when formed in excess they sojourn too long in the system without undergoing oxidation, which would transform them into urea and render them harmless. So long as the chemical work which ought to oxidize them is not finished, so long as the *coction* is not completed, the symptoms of overwork persist and the excretion of urea is less than normal. An improvement is accompanied with a profuse diuresis and an abundant precipitation of urea, and albuminuria when present disappears. Dr. Edward Cowles, in his Shattuck lecture before the Massachusetts Medical Society in 1891, has brought forward much valuable testimony to show that neurasthenia and conditions allied to insanity are largely due to the toxic products of over-fatigue which are always formed as the result of wear and tear of nerve and muscular tissue, and which contribute to local and general inanition and auto-intoxication. Maudsley long ago stated that all degrees of insanity, from the mildest form of melancholia to the wildest delirium,

may be due to the non-elimination of the waste products from the system.

It needs no elaborate demonstration to convince us that massage, by increasing the flow of blood and of lymph, thus causes to be brought a more abundant supply of nourishing material to the parts *massé·d*, at the same time removing waste products; that it brings food to the tissues and relieves them of their constipation; that it adds fresh fuel to the fire while removing the ashes, at one and the same time increasing the functions of the circulation as marketman and as scavenger.

Experience has long taught us the invigorating effect of massage upon nerves and muscles, and Zabludowski has shown that fatigued muscles regain their aptitude for work much more quickly by a few minutes of massage than by rest for a longer time; but Prof. Maggiora,* of the University of Turin, has demonstrated, by a series of accurate and interesting experiments, the restorative effects of massage upon muscles weakened by physical and mental labor and in other ways. He endeavored to ascertain:

1. The action of massage upon muscles in a state of repose. For this purpose the fatigue curves of the right and left middle fingers, in maximum voluntary flexion every two seconds, with a weight of 3 kilos (6.6 lbs.), were taken at 8 and 11 A.M. and at 2 and 5

*Archives Italiennes de Biologie, tome xvi, p. 225.

P.M., without massage; and the following day the fatigue curves of the same muscles, with the same weight and rhythm, were taken at the same time of day, after massage for three minutes. The average of the results showed that the muscles did almost

FIG. 1. FIG. 2.

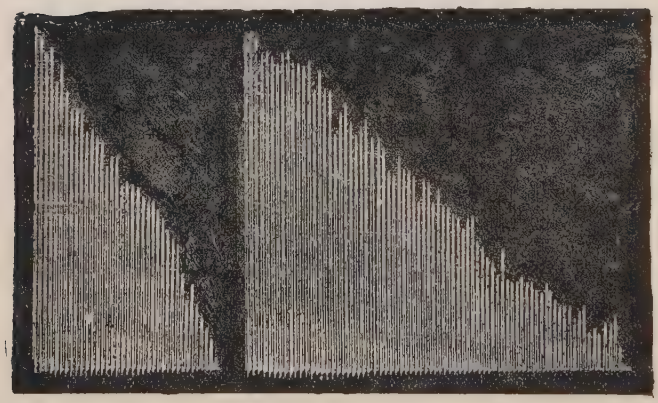

FIG. 1.—Normal voluntary curve of fatigue of the flexor muscles of the middle finger of the left hand, with a weight of 3 kilos and rhythm of 2 seconds.

FIG. 2.—Curve of the same muscles with the same weight and rhythm, after massage for three minutes. (After Maggiora.)

twice as much work after the massage as they did before (see Figs. 1 and 2). The average of the work without massage was 4,252 kilos, but after massage

8,019 kilos, before extreme fatigue prevented further contraction. When the electrical current was used to tire the muscles, by being applied to them or to the nerve supplying them, and the fatigue curves were taken without and after massage, the same results were obtained.

2. The second series of experiments were undertaken in order to find out whether the beneficial effects of mixed massage (friction, percussion, and kneading) increased in proportion to the duration of the application. At 8 A.M. the normal fatigue curve was taken, and again every 2¼ hours after this, being preceded by two, five, ten, and fifteen minutes of massage of the muscles of the middle fingers. Ten tracings were thus taken, and the result showed that with five minutes of massage almost all the useful effect that could be produced was obtained. (See Figs. 3 and 4.) When the massage was continued longer—for ten or fifteen minutes—there were but slight variations in the amount of work above and below that after five minutes. When electrical irritation was used to fatigue the muscles, similar results were obtained.

3. The third series of experiments were to determine the effects of the principal manœuvres of massage—friction, percussion, and *pétrissage*. The method of procedure was as before. There was very little difference in the work that could be done after five minutes of friction, compared with that after five minutes of percussion. There was a great increase of

work after *pétrissage* over that after friction or percussion; but the best effects were obtained after an alternation of these. Without massage the work was

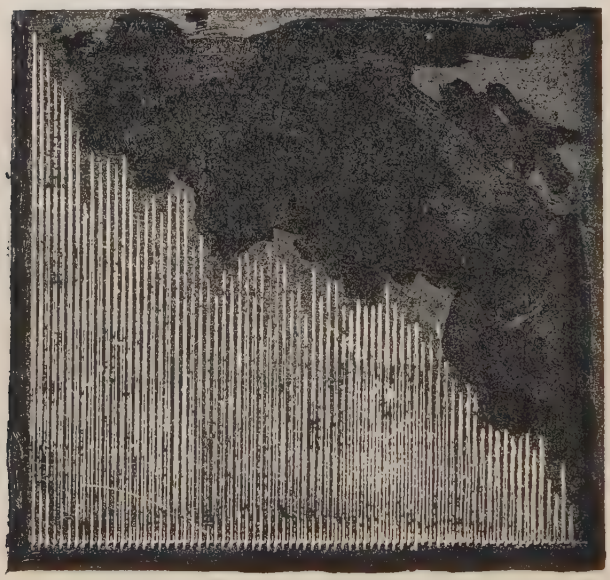

FIG. 3.—Normal curve of fatigue of the flexors of the left middle finger, with a weight of 3 kilos and rhythm of 2 seconds, after massage for two minutes. (Maggiora.)

represented by 4,674 kilos; after percussion for five minutes, two hours later, 5,718 kilos; after friction for five minutes, two hours later, 7,134 kilos; after *pétris-*

sage, two hours later, 8,172 kilos; after the alternation of these for five minutes, 8,829 kilos. Like results were produced when the muscles were fatigued by

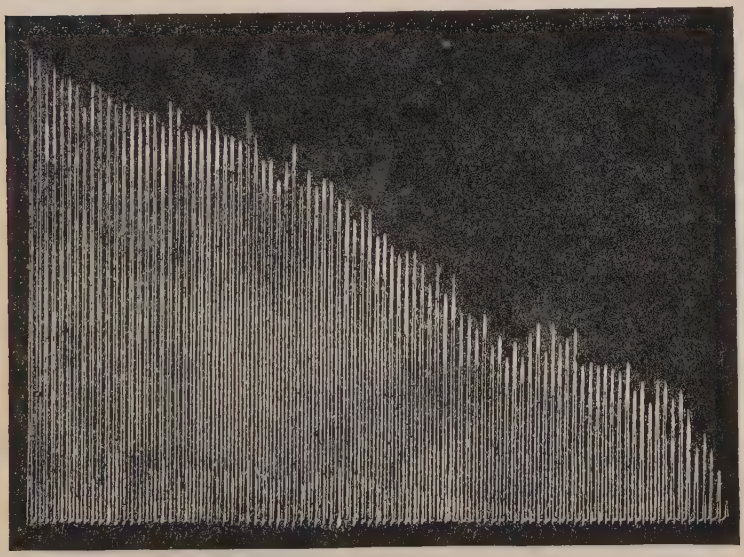

FIG. 4.—Normal fatigue curve (under same conditions as in Fig. 3) after massage for five minutes. (Maggiora.)

electricity in place of voluntary contractions. (See Figs. 5, 6, 7.)

4. The effect of massage upon muscles weakened by fasting was such as to restore them temporarily

to a normal condition, so that they gave natural tracings of fatigue; and the same result was obtained when the capability of the muscles for work was tested by electricity.

FIG. 5. FIG. 6. FIG. 7.

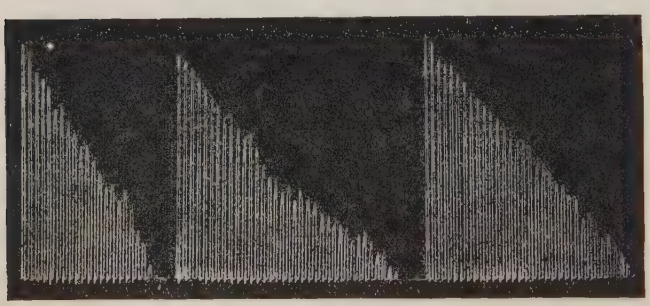

FIG. 5.—Normal curve of fatigue of flexor muscles of the middle finger of the right hand, with a weight of 3 kilos, and a rhythm of 2 seconds.

FIG. 6.—Fatigue curve of the same muscles after five minutes of percussion.

FIG. 7.—After five minutes of friction, percussion, and *pétrissage*, alternating. (Maggiora.)

5. The action of massage upon muscles tired as a result of general fatigue was also studied. After a walk of ten miles Dr. Maggiora took a fatigue tracing of both middle fingers, and found that the amount of work of which they were capable was only about one-fourth of what they did when he was rested. After

massage to hands and arms for ten minutes, they were so much temporarily rested that they produced a normal curve and did a normal amount of work. (See Figs. 8 and 9.) This, then, in one sense, was

FIG. 8. FIG. 9.

FIG. 8.—Fatigue curve of flexors of right middle finger after a walk of 10 miles.

FIG. 9.—Shows the influence of massage for ten minutes upon the same muscles already indirectly weakened by walking. Normal curve. Weight, 3 kilos; rhythm, 2 seconds. (Maggiora.)

more than equal to two hours of repose, for it was found that it required two hours of rest for muscles to produce a normal fatigue curve when the general system had not been previously tired out.

FIG. 10. FIG. 11.

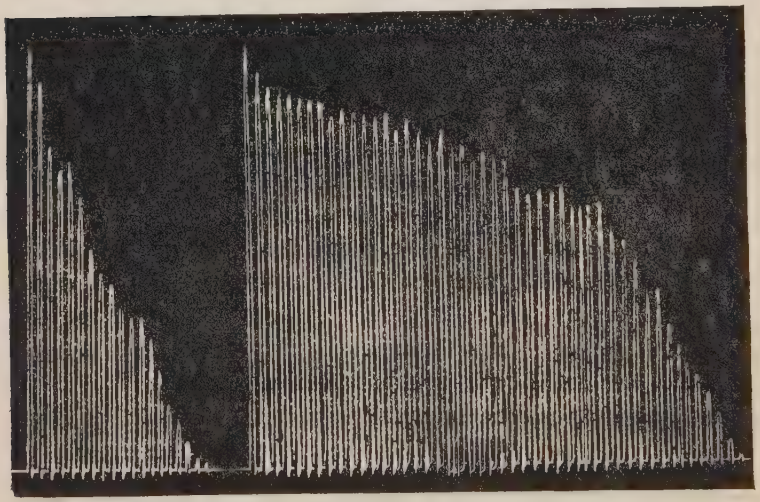

FIG. 10.—Fatigue curve of flexor muscles of middle finger of right hand, after being awake one night.

FIG. 11.—Shows the effect of ten minutes' massage upon the same muscles. (Maggiora.)

6. After the loss of a night's sleep the fatigue curve was very small, but after ten minutes of mas-

sage it was restored to more than a normal curve; and this could not be obtained by nourishment nor by tonics under the same circumstances at other times. (See Figs. 10 and 11.) In fatigue of muscles from fasting it was found that rest alone brought no appreciable relief, and in fatigue from wakefulness nourishment alone did not restore the muscles to their former vigor.

7. Intense and prolonged intellectual work produces a state of general lassitude. After the final examination of twenty medical students, which lasted for five hours, Prof. Maggiora was much exhausted, and then took fatigue curves of flexion of both middle fingers. This was only about one-fifth normal. Half an hour later, after ten minutes of massage, the fatigue curves were taken and were little less than normal. (In all probability these would have been equal to normal, had it not been that the muscles were fatigued only half an hour before.)

8. After a slight febrile attack of ten hours' duration, the muscles were weak all the next day. But the temporary effect of massage was such that the flexors of the middle fingers produced almost a natural fatigue curve.

9. The effect of massage upon muscles rendered anæmic was most interesting. It was found that anæmia of muscles for a short time—three to five minutes—produced phenomena similar to fatigue, or, in other words, diminished their vigor and resistance

to work. With a weight of one kilo attached to his middle finger, Prof. Maggiora produced 265 contractions without any fatigue. But when his brachial artery was compressed so as to render the muscles anæmic, the finger could contract only 11 times; and while the arterial current was still shut off, the assistant, Dr. Colla, gave the muscles a good mixed massage for three minutes, after which they could only contract 9 times. Massage has no effect, therefore, when the blood supply is shut off.

From these experiments it is evident, then, that the effects of massage consist essentially in reawakening the phenomena of the local circulation, in bringing to the muscles a greater quantity of material useful for their contraction, and in removing the retrograde products of muscular work. The inferences are so clear that they need not be stated.

CHAPTER III.

MASSAGE IN MUSCULAR RHEUMATISM AND NEURITIS.

A lady physician of New York, who lectures before training schools for nurses, in a recent monograph on massage speaks of "the lumbar region of the back." We have never heard of any other lumbar region, except on one occasion when an old lady asked her doctor where the lumbar region was. He replied that it was different with different people; with some it was in the head, with others it was out in the woods, but with the majority it was in the small of the back.

The muscles of the lumbar region and their fascia are favorite seats for rheumatism—which is then called lumbago, as every one knows. This may arise from catching cold, from strain, from fatigue, or from rheumatism in the system. The pathology of this affection is probably coagulation of the semi-fluid contractile muscular substance and adhesion of muscular fibrils, so that attempts at motion are accompanied with partial, irregular, and painful contractions. Retention of waste products occurs, and it is pretty generally conceded that uric acid is the worst of these, thus adding "fuel to the fire," and pressure upon nerve-filaments. Recent cases of muscular rheumatism are sufficiently common to any one engaged in the prac-

tice of massage. These are almost invariably cured by a few massages, sometimes by a single massage. The same result may be brought about by rest, by warmth, by electricity, or by the administration of medicines that eliminate uric acid, such as salicylate of soda, though I think not so soon. Any of these may be used separately, combined together, or with massage, thus affording us a choice of one hundred and twenty combinations of these five measures ($1\times2\times3\times4\times5=120$). But which of these is the most effectual single agent, could only be determined by the skeptical if they could have lumbago or muscular rheumatism sufficiently often to try each one separately and massage last of all, for in therapeutics this is a science of experience, and not one of experiment as it would be in physiology when tried on well people. A wearisome detail of cases of recent muscular rheumatism successfully treated by massage is unnecessary.

It is the object of this chapter to show that in these cases massage produces changes in five different ways: mechanical, thermal, electrical, nervous, and chemical. The mechanical change is shown by muscular rigidity being replaced by suppleness and elasticity, minute adhesions having doubtless been detached, and the coagulation of the muscular substance replaced by the semi-fluid condition. The matting together of skin, superficial fascia, and deep fascia is also removed by appropriate massage, so that

the skin glides more freely over the tissues beneath it. The pressure of the previous turf-like condition is taken away from the vessels and nerves, so that the patients feel lighter and suppler and freer from restraint. The thermal change results from the increase of heat imparted by the hand of the manipulator, as well as that arising from the massage and from the accelerated circulation. The electrical also, an objective change for which we do not need to take the patient's word, is manifest by more vigorous and agreeable contraction of the muscles to the faradic current after massage than before. For the nervous change we have to take the patient's word for improved sensation in the disappearance of pain, discomfort, and the feeling of stiffness. The chemical is inferred from the removal of waste products and uric acid by the increased circulation and flow of lymph, which, in plain language, removes the ashes, flushes the *sewers*, and takes away asphyxiated juices, while the increased arterial current brings a greater supply of nourishment; otherwise improvement would hardly take place. The constipation of the tissues is got rid of, let the refuse matter be what it may.

Dr. Haig has shown pretty conclusively* that when chilling of the surface checks the excretion from the skin, diminution of the alkalinity of the blood and retention of uric acid takes place in the tissues be-

*In the London Practitioner for March, 1891.

neath. The same result follows when fibrous tissues have been injured, strained, or excessively fatigued; uric acid accumulates in the affected parts, superadding its irritating properties, and this may be abstracted from the blood to such an extent as to show an increased alkalinity of the urine owing to diminished excretion of uric acid. This condition can be got rid of by salicylate of soda or by alkalies. When recent it can also be more promptly dispelled by means of massage, thus showing that this has brought about chemical changes. If massage and alkalies or salicylate of soda be used simultaneously, the medicine will act more quickly by reason of the improved circulation resulting from massage, as most, if not all, medicines do when the case is such as to admit of massage. This is a fact too often unrecognized, and frequently redounds unduly to the credit of massage, as when a patient has for a long time been taking a remedy that is clearly indicated, but shows no improvement until massage is used. On this subject let us hear from old Fuller in his *Medicine Gymnastica*, published in 1771: "It is to be considered that some medicines may require exercise (of the patient) in order to enhance their virtues or to remove some inconveniences attending their operation which might deter people from using them so freely as they ought to do. The ordinary circulation of the blood may not suffice to answer the nature of some medicaments and call out their efficacy. Exercise in such cases is like

the just and exact incubation to the egg: that which animates the drug and gives it power to produce the desired effect."

It is hardly necessary to state here that, whatever treatment be adopted for acute muscular rheumatism, the diet should be regulated and highly nitrogenous foods and acid wines interdicted for a time.

Zabludowski, Hopodizë, and others have found by careful observation that general massage in healthy people increased the excretion of urates and phosphates, and the assimilation and metamorphosis of nitrogenous food substances.

As to the mechanical effect of massage, we might learn a lesson from nature. Adhesions of the pleura are often detached by the rubbing together of the two membranes in respiration. The fascia of muscles is a sort of a pumping arrangement by which lymph is sucked out of the muscles and propelled onwards into the lymphatics. It consists of two layers, between which are lymph spaces terminating in lymphatic vessels. When the muscles contract, the inner layer is pressed against the outer and forces the fluid onwards into the lymphatic vessels. When the muscles relax, the inner layer recedes from the outer, and the lymph from the muscles finds its way into it and the lymph spaces between. Hence by the contraction of muscles, waste products are washed out of them by the flow of fresh lymph. But patients with a severe attack of lumbago cannot exercise. In such

cases massage is more than a substitute for exercise —so much more, indeed, as the pressure of massage may be greater than the pressure which muscles make upon each other during contraction. In my Treatise on Massage I have not only described the manner of using massage in such cases, but also the effects of friction and deep manipulation in the direction of the lymph and venous currents. The veins and lymphatics are mechanically emptied, the blood and lymph are pushed along more quickly, by the *vis a tergo* of massage, and these fluids cannot return by reason of the valvular folds on the internal coats of these vessels. More space is thus created for the returning currents coming from beyond the region *massèed*, and the suction power induced at the same time adds another accelerating force to the more distal circulation. In brief, the effects may well be likened to those of a combined suction and force pump; and in people that are not too fat the veins can be seen collapsing as they are emptied, and filling up again as their contents are pushed along by the hands of the manipulator. In this way the collateral circulation in the deeper vessels is aided and relieved, as well as the more distal stream in the lymphatics, capillaries, and arterioles. One would naturally suppose that the circulation in the larger arteries would, in this manner, be interrupted; and such is the case. But herein comes an additional advantage to aid the circulation: for the temporary and

momentary intermittent compression causes a dilatation of the arteries above the parts pressed upon, from an increased volume of blood; and as soon as the pressure is removed this accumulation rushes onward with greater force and rapidity into the partially emptied continuation of the arteries, in consequence of the resiliency of the arteries and the force of the heart's action upon the accumulated volume of blood.

The difference in the consistence of muscles is of much interest. The muscles of some very strong people are soft and flabby when relaxed; of others, hard and firm. This difference is no indication of muscular power or the want of it. It is due to the condition of the fascia that surrounds the muscles. When this is thick it gives a feeling of hardness; when thin, of softness. The contractile substance of muscle is semi-fluid, as has been shown by Kühne. The same difference exists in dogs and other animals. The muscles of short-haired dogs are usually hard and firm; of long-haired dogs, soft and flabby; and Ludwig has shown that the former yield much lymph, the latter little. Lauder Brunton is of the opinion that this difference in the deep fascia may account for the tendency to muscular as distinguished from articular rheumatism. Where muscles are soft from thin fascia, the tendency to muscular rheumatism is probably greater; whereas persons whose muscles feel hard from thick fascia most likely have a tendency to articular rheumatism. When the fascia is soft and

thin, the products of waste from exertion or other cause would incline to remain and occasion muscular pain; when the fascia is hard and thick, waste products would be removed more quickly from the muscles and might give rise to inflammation of the joints.

I have seen cases of muscular rheumatism where the muscles felt preternaturally firm and hard—so much so that one might imagine that a quantity of plaster-of-paris had been injected under the skin and allowed to set,—but under massage they became soft and supple as the case improved. The following case, though a somewhat obstinate one, is an example of this:

Case 1.—Mr. J——, a large, stout gentleman, had been subject to attacks of rheumatism in the trapezius, deltoid, or lumbar muscles all his life. At one time he was seized suddenly and severely with pains in the lumbar region so that he could not even attempt to move. I was called to him the first day of this attack, and found all the muscles of his back, but especially those of the lumbar region, rigid, hard, and board-like, and almost insensitive to pressure. Perhaps the lessened sensation to external impression was owing to the already existing severe pain. Issues of vast importance depended upon his recovery in a short time; so massage was given twice daily for a week. At the end of this time the muscles were supple and elastic, sensitive, even tender, to pressure, but the pain had disappeared and the patient could move freely.

Treatment is sometimes used to prove the diagnosis, as when iodide of potassium is given in cases of doubtful syphilis. Reasoning in the same way, Dr. Haig asserts that when any local irritation is not increased and made worse by acids given to the extent of distinctly raising the acidity of the urine and diminishing the alkalinity of the blood, or is not improved by alkalies given to the extent of decided diminution in the acidity of the urine or increase in the alkalinity of the blood, or by a salicylate given to the extent of producing a great increase in the excretion of uric acid, then such local irritation is not directly due to uric acid.

In the same manner I would venture the suggestion that when a case of apparent muscular rheumatism does not only yield but also stay improved after a few massages, then the probability is that the case is one of neuritis affecting the nerve-filaments that supply the impaired muscles. This probability would be strengthened when the pain is uniform, affecting the same muscles (or nerves, rather) on both sides (though there are plenty of these cases where the muscles and nerves of one region only are affected), when it is worse at night whilst the patient is warm and at rest in bed, and better when up and moving about, which calls into play the inhibitory action of the will; whereas muscular rheumatism is aggravated by motion, and relieved by rest and warmth. The difference in favor of a diagnosis of neuritis would

be increased when the consistence of the affected muscles does not differ from that of the well muscles, or is somewhat diminished. Of course it is not a question here of marked cases of neuritis where the pain is confined to one or more nerves and their distributions, with atrophy of muscles, altered electrical reactions, glossy skin, etc.

The relief from discomfort, and the freedom of motion, experienced after each massage in these cases which are too apt to be hastily diagnosed as muscular rheumatism but most likely are neuritis, is so great that, though the temporary improvement may not be held, yet the patient is apt to demand that the massage be continued until the ultimate result is reached, which with appropriate internal medication should be recovery. The following cases may be cited as examples:

Case 2.—Mr. D—— was 63 years of age, and had always enjoyed good health with the exception of frequent attacks of asthma. He was well nourished, having a due proportion of muscle and fat. He came to me in July, 1887, suffering from stiffness and discomfort in the shoulders and hips, of several weeks' duration. This first appeared in the hips. On account of the discomfort, he was restless and uneasy at night. At first sight this trouble seemed to be entirely muscular; and this view was strengthened by the result of treatment, for he had massage and passive motion early every afternoon nine

times in succession, and after each massage he could bend his body freely from the hips, and rise from a chair without the assistance of his arms, cross each leg over the other with ease to tie his shoes, and dress himself, even to putting on his coat, as if there were nothing the matter with his shoulders—all of which he could not do before massage. This improvement continued the remainder of the day, but, unfortunately, next morning he was almost as stiff as ever. Though his deltoids and glutei did not appear to be altered in consistence, yet after massage they were much suppler and afforded corresponding freedom of motion. Evidently the patient ought to have had massage twice a day, so that the effect of one *séance* would not have been gone before he had another; but instead of this there was an interval of ten days in which he had none and grew rapidly worse. Then he had massage every other day for three times, with but slight temporary improvement after each. After this he tried traveling three weeks, during which he was drowsy and depressed, and came back worse than when he went away, so that it was with great difficulty that he could raise either foot high enough to get into a carriage, and it was hard for him to get on his coat even with assistance. He stooped like an old man. Pains in the fingers had also set in, so that it was difficult for him to hold a book. The muscles of the shoulders and upper arms and of the hips and thighs had become somewhat atrophied and flabby,

with diminished reaction to galvanic and faradic currents, and increased irritability to percussion. Pressure on the large nerve trunks and muscles showed no tenderness. He was about four months getting into this, his worst condition, in which he remained for three months; and he was five months, or the balance of a year, getting well. During this time, as if by way of compensation, his asthma scarcely troubled him. Even at his worst he continued to get about and to attend to business. He had electricity occasionally in the daytime, and massage almost every evening on retiring, which gave him much relief and comfort and helped him to sleep better. He is firmly of the opinion that massage aided his recovery and shortened his sufferings by at least one year.

This case was undoubtedly one of neuritis. And what is of the greatest interest is the fact that just before the first symptoms appeared he had been taking five drops of Fowler's solution of arsenic three times daily for six weeks for his asthma; five months later, arsenic was found in the urine in large quantity by Prof. E. S. Wood, of Harvard University. During his recovery, the patient on his own responsibility took a secret preparation containing arsenic and hydriodic acid for his asthma. The neuritis that was most likely left by the arsenic in the first instance was probably benefited by the arsenic in the secret preparation — and so thought an eminent neurologist under whose care he was for a while.

Case 3.—Another case, very much similar to the foregoing, came to me in September, 1891. It was that of Mr. C——, 67 years of age, weighing 168 lbs., who, though of pale complexion, had red lips and had enjoyed remarkably good health all his life. Ten or twelve years before, he had had slight lumbago. For about four weeks, pain and stiffness in the shoulders and hips, at the back of the neck, and between the shoulders, had been gradually increasing, so that it was not easy for him to put on his coat or button his shoes. He was worse at night after he had been in bed for some time, and also in the morning, but improved somewhat after getting up and moving about. Every patient is a standard for himself as to the consistence of his tissues, and, so far as could be judged through this patient's adipose, the muscles seemed to be somewhat doughy and flabby, especially the deltoids and glutei. Those of the upper arms and thighs were apparently slightly atrophied and deficient in contractility to the faradic current. His appetite was not very good, and he had not taken a vacation for many years. Salicylate of soda had been thoroughly tried, without any result. The immediate effect of massage from the first was magical, affording comfort and freedom of motion the remainder of the day on which it was given—which again led us to think the trouble altogether muscular. But his nights were still bad, and in the mornings he was as stiff as ever. The longer he slept, the stiffer he became.

He continued the massage faithfully for eleven weeks, daily or every other day, always with great temporary relief, but on the whole gradually becoming stiffer and more uncomfortable. Iodide of potash, tonics, and the faradic current were in turn faithfully tried with the massage, but did not afford any more relief than massage alone. Ten grains of phenacetin in the evening, and ten more when he wakes at night, will give him a good night's sleep and a comfortable day after. But he has to omit this for a day or two before it will have this effect again. Five or six weeks after I first saw him, pain and stiffness gradually came in the fore and middle fingers of the right hand, and the pain was also distinctly traceable in the course of the radial nerve.

I referred this patient to Dr. E. G. Cutter for further internal treatment, and under iron and cod-liver oil his general condition has improved and his appetite is better. For a month he has done nothing for his joints and muscles, and they remain in about the same condition—he requires assistance to dress. Like the preceding case, this gentleman attends to business at his worst. Unlike the preceding case, he is so far of a cheerful disposition, and has not been exposed in any way to arsenical poisoning—his wall papers are free from arsenic, and he has not taken any in medicinal form. He therefore regards it as superfluous to have his urine examined for arsenic; so it has not been done. Neither has it for lead. He is

a temperate man, so that alcohol does not enter into the case. Three weeks after he had been under massage the urine was examined and found to contain a larger than normal amount of urea (12.25 grains to the ounce), due probably to increased tissue metabolism produced by massage. A large primary deposit of oxalate-of-lime crystals was also found. In other respects the urine was healthy.

It is a pity that we are not absolutely certain that there is no arsenic in this patient's urine; for if there be none, as most likely there is not, it would count strongly in favor of the arsenic found in the urine of the preceding case having nothing to do with producing his neuritis. As arsenic seemed to benefit the neuritis in the first case after the poison had been eliminated from the system, then it might have been a good remedy to have employed for the second case. How much better arsenic may act while a patient is undergoing massage, can only be conjectured. How much more quickly it may be eliminated while the patient has massage, is also a subject for consideration. Dr. G. Tedeschi has reported a case* of lead poisoning cured by massage after the usual treatment had failed. By this means, he found, the urine was increased in quantity, and the lead eliminated more promptly than by any other means.

Case 4.—What is called rheumatism, frequently

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*Giornale Intern. delle Sci. Med.

affects both muscles and nerves. An acute case of rheumatic sciatica can sometimes be speedily changed for the better by means of massage, even when this does not afford such marked temporary relief as in the cases of neuritis just mentioned. In March, 1888, I was kindly asked by Dr. J. B. Ayer to visit his patient, Rev. B. H——, 58 years of age, who was well nourished, with tissues supple and elastic except in the regions affected. He was then in his third attack of sciatica, or more properly rheumatic neuritis of the sciatic nerve—all three attacks having been traceable to his getting run down from overwork, and each attack having been preceded by lumbago, which faded away as the affection of the sciatic nerve became more pronounced. The lumbago had affected the muscles on both sides; the sciatica, the right hip, thigh, and leg. The first attack had occurred eighteen years before, and lasted for three months; the second, eight years after and lasted for six months, worse than the preceding. The third attack had lasted severely for four weeks before I saw him; and, according to the same geometrical progression, we calculated and feared that he was in for a year of it. Anti-rheumatics, tonics, sedatives, galvanism, and faradism had produced no sensible amelioration. We were agreeably disappointed, for in four weeks and a half—under massage once a day most of this time, and morphia when the pain became intolerable—he was to all intents and purposes well. Afterwards, whenever he

felt any premonitions of a returning attack, he had recourse to massage, a few applications of which have always afforded the desired relief. And this brings me to say that when a patient has been benefited by massage, if a relapse or reappearance of the same trouble takes place it is much more speedily relieved or cured by massage than it was at first—or, in other words, the patient has become more susceptible to the influence of massage.

Further details of this case, for those who may desire them, are the following: The patient was still suffering from lumbago when I first saw him, and he had "shocks" of pain in the lumbar region while standing at his toilet. The thigh admitted of but moderate flexion before the tension and pain in the gluteal region limited motion, and at the origin of the glutei he had a distinct loss of power. Pressure at the exit of the sciatic nerve and on the outside of the thigh was painful, the region being sore and tender; and the fibular region was numb as well. The whole posterior aspect of the thigh was constantly uncomfortable, and, moreover, pain came in exacerbations. His nights were passed in restlessness, tossing and turning. After the first massage at 8 P.M., he fell into a sound sleep for one hour, then awoke with pain more violent than ever, for which he took morphia and then went to sleep for two or three hours, when he again awoke with violent pain and renewed the morphia. And thus he passed the night—with sounder sleep,

alternating with greater pain when awake. But the following day he was a little better. The night following the second massage was rather more comfortable, and on that after the third massage he awoke but once and did not require any morphia. After the fourth massage he woke up often, but was so comfortable that he did not need any morphia, and he showed a decided change for the better on the following day. At the fifth visit, massage was given to leg, thigh, and hip only, as the pain in the lumbar region had disappeared and suppleness of tissue had returned. The manner of using massage was by gentle stroking, or *effleurage*, on the posterior aspect of the limb, and deep vigorous manipulation on the lateral and anterior aspects. Sometimes it is well to use deep pressure so as to squeeze congestion out of a nerve, and then vigorous percussion over it so as to produce an obtunding effect. But these were out of the question in this case. The sixth massage seemed to rouse a slumbering soreness, and made the whole limb uncomfortable for an hour, but after this it felt better than before and continued so. Subsequent massages had a similar effect. This was, without doubt, due to the detaching of adhesions which caused *matting* of the tissues. This required arduous work, but as suppleness and elasticity returned the work became easier. At the twelfth visit, after forty minutes of massage to leg, thigh, and back, the patient felt that if I did any more it would certainly arouse

the pain which the massage had just quieted. This was near the end of the third week, and he could run up and down stairs freely. And so he improved, with interesting variations, pain decreasing with intervals of comfort increasing. On the thirty-first day after massage was begun he preached twice, superintended his Sunday school, distributing presents to the children, and felt no worse after it. Sixteen massages in four weeks and a half, then a week's vacation, and he was himself again. But the external aspect of the leg, from the knee to the toes, has remained numb ever since.

Dr. A. Symons Eccles, of London, in an article* on "Massage, Rest, and Position in the Treatment of Sciatica," has reported several cases of sciatic neuritis in previously healthy people which he treated successfully in this manner after the failure of other means. The massage consisted of *effleurage*, kneading, and percussion, and in the intervals the leg was suspended in a Salter swing, as this was the only position that afforded rest.

For the influence of massage in other phases of muscular rheumatism and neuritis, I must refer the reader to my Treatise on Massage.

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*London Practitioner, November, 1887.

CHAPTER IV.

MASSAGE IN DIABETES.

The simultaneous use of massage while the patients are being douched, is the characteristic mode of treatment at Aix-les-Bains. The hydrosulphurated thermal waters of Aix are too feebly mineralized to be employed in any other way than externally, which is thought to favor the absorption of sulphuretted hydrogen by the skin. Dr. Forestier has treated seven cases of saccharine diabetes in fat people by means of the douche-massage, with the result that there has been in all a great decrease in the glycosuria. Meantime these patients lived *à la table d'hôte*, eating a mixed diet of meats, sweets, fruits, and amylaceous substances, with *liqueurs* after repast, and followed their ordinary habits as to exercise.*

The douche-massage was given while the patients were sitting or lying, by two masseurs, one of whom took the limbs, the other the trunk, each directing a jet of water from a nozzle under his arm, douching and *masséing* at the same time for ten or fifteen minutes daily, the water being at from 37° to 40° Centigrade (about 100° F.).

The patients thus treated were classified as belonging to the form of saccharine diabetes called

* Archives Générales de Médecine, September, 1891.

diabète gras by Lancereaux, by the English slow diabetes. All seven presented the strictest analogies and fundamental characteristics of *diabète gras:* age 50 to 60, *embonpoint* or confirmed obesity, great thirst, voidance of large quantities of urine, and muscular fatigue. These symptoms were overshadowed in four cases by the existence of arthropathies, and in two by neuralgia which had been mistaken for chronic rheumatism, and in one of the latter this diabetic neuralgia seemed like that of tabes affecting the crural and sciatic nerves.

Under the douche-massage treatment the decrease of sugar in the urine was great: in the first case from 24 grammes in twenty-four hours, to 1.80 grammes after the twentieth massage, in twenty days; in the second case, from 117 grammes to 66 grammes after the twenty-fifth massage, in twenty-five days; in the third, from 87 grammes to 18 grammes after twenty massages, in twenty-two days; in the fourth, from 319 grammes to 101 grammes after nineteen massages, in nineteen days; in the fifth, from 42 grammes to 5 grammes after twenty massages; in the sixth, from 30.75 grammes to 11.40 grammes after twenty massages, in twenty-four days; in the seventh, from 291 grammes to 80 grammes after twelve massages, in twelve days.

The quantity of urine and frequency of micturition also diminished. The proportion of urea to nitrogen was considered the co-efficient of oxidation.

This at first was somewhat less than normal, but gradually increased, showing an augmentation in the intensity of oxidation and an acceleration of retarded nutrition. This was the case in those presenting a large quantity of sugar as well as in those with less. The variations of the uric acid were identical in five cases—increasing considerably, and finally falling below its primitive figure. Phosphoric acid, which was present in large quantity before the treatment, gradually decreased. The general conditions of the patients were much improved: appetite and digestion were better, sleep more refreshing, muscular fatigue dispelled. The pains and stiffness of the joints were greatly benefited, but the neuralgia which affected the crural and sciatic nerves in one patient was still troublesome though the general condition had become excellent.

The douche-massage is regarded by Dr. Forestier as one of the most powerful measures of hygienic therapeutics for fat diabetics, and can be used at the same time with other treatment, such as the internal administration of the mineral waters of Carlsbad and Vichy and Brides. But these are probably better suited for diabetics with voluminous livers and hepatic troubles, whereas the hygienic treatment by the douche-massage seems rather indicated in cases of diabetes where there is no appreciable trouble with the liver, and where the general condition alone is at fault. The results in Dr. Forestier's cases would

probably have been still more favorable if the diet had been restricted and sweets and starches omitted; but in order to put the massage treatment to the severest possible test, a full mixed diet was allowed. This might do when the physician is obliged to have recourse to more mild treatment than that of special regimen in order not to discourage the patient.

As to the duration of improvement after the discontinuance of treatment, but little is said, except in two cases. In the one that had 319 grammes of sugar in twenty-four hours, and in whom it decreased to 101 grammes after nineteen massages, this at the end of eight months and modified diet at home had still more decreased to 2 grammes in twenty-four hours. The following year this patient went to Vichy, and two years after he left there the urine showed 53 grammes in twenty-four hours. In another case, which had been at Vichy for several years previously, the glycosuria had always increased to the same degree (40 to 50 grammes) in the intervals between his sojourns there. Under twenty massages it decreased from 42 grammes to 5.40 grammes; but whether it remained so or changed, we are not told.

But massage would have had the same effect without the douche with the Aix-les-Bains water, except so far as the cleansing effect was concerned. This is simply another illustration that every substance capable of being rubbed on the human body has had wonderful virtues ascribed to it; and it must

be that which is common to them all that does the good—namely, the rubbing. As proof of this, and as evidence confirmatory of the value of massage in diabetes, Prof. Finkler of Bonn has used general muscle-kneading alone in fourteen cases of diabetes. The diet at the same time was mixed. A few of the patients were confined to bed, others were able to go about, and some did severe manual labor. The patients were at first *masséed* once daily, and later morning and evening, for twenty minutes, all over their bodies. The results were favorable, as shown by decrease in the quantity of urine and of the sugar in the same, diminution of thirst, return of perspiration, and increase of body weight. After three months of treatment by massage, the sugar entirely disappeared from the urine of one patient, and this remained absent for three months and then returned.

CHAPTER V.

THE TREATMENT OF CHRONIC DIARRHŒA BY REST AND MASSAGE.

We have always considered that massage was contra-indicated not only in cases of acute, but also in cases of chronic diarrhœa. At any rate, when at the request of others I have used it either for a local affection not connected with the diarrhœa, or for the improvement of the general condition in those suffering from diarrhœa, it has been invariably without success. Perhaps the failure was due to the fact that I did not dare to use it upon the abdominal organs, as Dr. Eccles has done with good results. The philosophy of his treatment is so sensible, and the results so favorable and contrary to expectation, that it is with all the more pleasure we refer to them here. His paper on "The Treatment of Chronic Diarrhœa by Rest and Massage" was read at the International Medical Congress, and published in The Practitioner, December, 1890, and January, 1891. In it he tells us that one of the most notable features in all cases of chronic diarrhœa is the atony of the muscular coat of the stomach and intestines, probably brought about by the development of alkaloids, the products of decomposition, which also produce not only nervous symptoms but to some extent anæmia, fatty degeneration, and emaciation.

Whatever may be the condition on which the production of these alkaloids depends in acute stages of the disease, there exist in the more chronic a want of tone and an atrophy of the stomach and intestines, involving both mucous and muscular coats, with consequent diminished absorption and deficient muscular action, so that the food remains in the stomach for a longer period than is necessary for the normal processes of digestion, while the gases resulting therefrom are not subjected to the pressure normally exercised upon them by the healthy muscular coat of both stomach and intestine. By reason of the non-evacuation of the stomach in due time, the process of peptic digestion is not arrested; its action upon albuminoid substances probably results in the constant diminution in size of albuminoid molecules until these are no longer fitted for absorption and subsequent synthesis in glands, blood, and tissues.

Dr. Eccles made the very interesting and instructive experiment of administering milk, over-peptonized until it had become bitter, to a patient suffering from chronic diarrhœa; and there resulted flatulence, intestinal colic, and loose, sour-smelling dejections. He relies on the salol test, its reaction in the urine occurring simultaneously with its passage out of the stomach. In healthy people this occurs about forty-five minutes after a meal, but may be hastened by massage. In cases of chronic diarrhœa no improvement in body weight was observed when the test failed to give the

reaction within three hours. The progress of his cases and the existence of diarrhœa were measured by the rapidity or slowness of the absorption of salol. Rest of mind and body, and physiological rest of the gastro-intestinal canal, were enjoined. Diarrhœa itself is a symptom of pathological unrest. Bodily exercise and fatigue are followed by increase of diarrhœa. Absolute rest is necessary for those who are much prostrated; but for those who are not, massage is of value in overcoming the evils of rest.

In several cases of sprue treated by Dr. Eccles the result was all that could be desired. Before undergoing the rest and massage treatment, every attempt to improve the regimen was attended by increase of white discharge from the bowels and a return of the ulcerative patches characteristic of the disease. In no set of cases has he found massage produce more markedly beneficial results. The number and duration of the *séances* depend upon the requirements of each case. Frequent examination of the patient's abdomen alone affords reliable indication as to dosage. Generally speaking, he found it advisable to use massage of the abdomen three times daily at least, the duration of each application depending upon the results sought to be obtained. In the less serious cases he gave massage for ten or fifteen minutes within an hour after meals; in more serious cases massage should be used both before and after meals, with or without firm kneading of the

shoulders and back. In the early stages of the treatment general massage of the body is given once daily; and as the food taken and strength and weight increase, massage of the whole body is given twice daily. (It would take but few patients of this kind to occupy the whole time of a physician masseur; and these ought to be as rich as Crœsus to be able to remunerate him for six or eight massages a day. In the United States it is customary to slack up treatment as the patient improves.—*Reporter.*)

In lienteric diarrhœa Dr. Eccles found it useful to employ systematic massage of the abdomen before meals, first using vigorous rubbing over the hypochondriac and epigastric regions, followed by careful kneading of the whole abdominal walls. In chronic diarrhœa dependent on climatic influences, massage shortly after meals, he thinks, is indicated.

It is not claimed that mechanical means alone suffice in these cases.

When careful manipulation over the abdomen alone does not relieve the painful distension of the stomach by gas, the trapezii muscles should be thoroughly and vigorously kneaded. This is almost invariably followed by marked reduction of flatulence. The rationale of this is clear, owing to the intimate connection between the spinal accessory and vagus nerves. The effects of massage in these cases are thus summarized:

1. The generation of gas within the stomach

and intestines is diminished and its expulsion effected.

2. The onward movement of the gastro-intestinal contents is favored.

3. The rapidity of the circulation through the visceral lymph- and blood-vessels is increased.

4. The circulation through the liver is improved, and thus the destruction of alkaloids by this organ is promoted. Perhaps not the least valuable effect produced by abdominal massage is the stimulation to much more vigorous action of the diaphragm, and the consequent auto-massage produced by the deeper inspirations and abdominal reflexes.

5. The abdominal vascular area is dilated.

6. The rate of absorption from the intestines is increased.

7. The intestinal nerves are stimulated.

8. Much of the muscular prostration in these cases may be referred to the circulation of alkaloids absorbed from the intestines, and the aching and muscular pains complained of may be produced by the retention of poisonous albuminoids in the lymph spaces of the tissues, the dislodgment and removal of which can be effected by means of massage.

But it still seems to us that all these beneficial influences of massage would be much more appropriate for chronic constipation than for chronic diarrhœa.

CHAPTER VI.

MASSAGE OF THE ABDOMEN FOR INDIGESTION, MIGRAINE, CHRONIC TYPHLITIS AND PERITYPHLITIS—MASSAGE IN MYXŒDEMA, INTERMITTENT FEVER, ETC.

In dilatation of the stomach and chronic dyspepsia, massage has proved of benefit, the distressing symptoms disappearing and the patient gaining flesh and strength. It should be applied as much as possible over the stomach, working from the left side upwards and inwards under the false ribs so as to empty the stomach of its contents whilst stimulating the contractility of its muscular walls. The effect of gravity causes the food to lodge in the most dependent portion, in the greater curvature, and it needs to be pushed along towards the pylorus at the same time that peristaltic action is being increased. The whole abdomen should be *masséed* at the same sitting, as the bowels are usually sluggish also in these cases. Rubens Hirschberg, of Odessa, reports many cases of this kind which he relieved or cured by means of massage, and lays special stress on the fact that massage has an ultimate chemical influence in causing the disappearance of sour, burning eructations, foul breath, and bad taste in the mouth, as well as of sensations of weight and fullness, which would indicate an improved

state of the gastric juice and better contractions of the stomach. I have witnessed the same result in several cases under my care. Hirschberg invariably found in these cases, what I have seldom met with, that massage of the abdomen for thirty minutes had a decidedly diuretic effect, the daily quantity of urine in some being increased to three times the usual quantity without any other inconvenience save that of frequent micturition. When massage was discontinued the urine fell to its former quantity. The increase of urine probably depends upon more active absorption of fluids from the digestive tract, increased blood-pressure, and stimulation of the splanchnic and pneumogastric nerves below the diaphragm, caused by massage. Contra-indications to the use of massage over the stomach or bowels would be: Symptoms of cancer or ulcer, acute or febrile states, and a suspicion of a tendency to hæmorrhage. If cicatricial contraction of the pyloric orifice existed, massage might increase the dilatation, for the walls of the stomach would in all probability yield more readily than the cicatrix.

Salol serves a useful purpose in showing us when the contents of the stomach pass into the small intestine. Insoluble in the gastric juice, it is decomposed into its two constituents, salicylic acid and carbolic acid, in the small intestine where it is subjected to the action of the pancreatic juice, which renders it soluble and easy of absorption. Soon after absorption

into the circulation it passes through the kidneys into the urine as salicyluric and sulpho-carbolic acid, its presence being shown by the production of a reddish-violet precipitate when the urine, after acidulation with hydrochloric acid and shaking with ether, is tested with a solution of perchloride of iron. Professor Ewald tied the pylorus of a number of dogs, then gave them large quantities of salol, without obtaining the reaction of this in the urine. Dr. Sahli found that acute catarrhal conditions, as well as chronic dilatation of the stomach, delayed the decomposition and absorption of salol. The experiments of Prof. Ewald and Dr. Eccles agree in that they found that in most cases under natural conditions, without massage, salol could be detected in the urine in forty-five minutes after its administration; but after massage upon the abdomen for fifteen minutes, the reaction of salol was obtained in thirty minutes. In two obstinate cases the addition of general massage had a more favorable effect in hastening the absorption of salol than did massage of the abdomen alone. After the administration of one gramme of salol to people suffering from chronic dyspepsia, Hirschberg, Brunner, and Huber found that it required from two hours to two hours and a half before the reaction of salol could be detected in the urine. But after a walk of fifteen minutes or gymnastic exercise for ten minutes the reaction was obtained in one hour and five minutes. Similar results were obtained from faradization,

but massage proved more efficacious than any other means. Hopadzë has made a series of observations showing that massage of the abdomen for ten minutes lessens the sojourn of the food in the stomach from fifteen to seventy-five minutes. He also made other observations upon healthy people, proving that the nitrogenous metamorphosis in four persons to whom he gave daily massage for twenty-five minutes invariably increased and lasted for seven days after a week of massage. The assimilation of the nitrogenous substances of the food increased in all the cases and lasted during the week after massage. All four persons gained in weight during the week following the week of massage; but during the week of massage one gained in weight, two lost, and one was unchanged. The results obtained by Zabludowski were similar.

By means of massage it would seem to be possible to push the contents of the small intestine in either direction. In order to obtain a mixture of the pancreatic juice, the bile, and the *succus entericus*, Dr. Boas of Berlin rubbed the abdomen from the region of the right hypochondrium towards the median line, after the stomach digestion had ceased and that organ was empty. This procedure gradually relaxed the pyloric sphincter, and after a time the intestinal juices entered the stomach in considerable amount. These were then withdrawn by the stomach-pump. The amount of secretion thus obtained in twenty cases

was, on an average, 40 to 50 c.c. (10 to 12½ drachms) for each.

After a gunshot wound, Alexis St. Martin had a permanent opening into his stomach, which was stopped by a valve of mucous membrane. This valve could be pushed back and the interior of the stomach seen. The experiments of Bernard on dogs gave similar results to those of Dr. Beaumont on the inner coat of the stomach of St. Martin. While moderate stimulation of the stomach caused secretion, great irritation had an opposite effect. When the mucous membrane was gently stroked with a glass rod, the natural pale pink color changed to rosy red and the membrane secreted juice abundantly; but when violently rubbed the color disappeared or became pale, the secretion of gastric juice stopped, that of mucus increased, sickness and vomiting followed. The primary dilatation of the vessels seemed to be replaced by contraction, the opposite of what usually occurs from massage outside of the stomach.

By a series of elaborate and careful observations on healthy people, Dr. Symons Eccles, of London, found that thirty minutes of massage on the abdomen lessened the temperature on the surface of the body and increased that in the rectum; but general muscle-kneading, omitting the abdomen, had just the opposite effect, causing the axillary and surface temperature to rise while that in the rectum fell.

The prolonged application of massage upon the

abdomen usually retards the action of the heart, probably by its reflex influence on the vagus nerve and the withdrawal of a large quantity of blood into the abdominal vessels from other organs. General muscle-kneading, as studied by Eccles, caused a variation of the pulse-rate, from a diminution in most cases to an increaee of twenty beats a minute. But whether the pulse was accelerated or retarded, there was always found an increase of blood-pressure even when the skin was red and warm and the vessels dilated—due, it seemed to be, to increase in the force of the heart's action. Stroking or *effleurage* alone generally increases the pulse-rate; manipulation or kneading alone generally retards it.

Dr. P. O. Glovetzky has made a series of experiments on man and dogs to elucidate the influence of abdominal massage on the circulation and respiration. The upper half of the body markedly increased in weight after the *séance*, as shown by Mosso's balance. But he has neglected to tell us how the horizontal position alone affects the upper half of the body without any massage. Plethysmographic measurements showed that during the massage both the upper and lower limbs increased in volume, to return to their usual size after the massage. The upper extremities showed more often a *consecutive* increase in bulk, while the lower ones were found not infrequently to be decreased in volume. The blood-tension and intracranial pressure invariably rose during the manipula-

tion and lasted for a certain period after the sitting. The pulse at first became more rapid and smaller, but towards the end of the *séance* it was found to be slow and full. Respiration always became more energetic. In artificial asphyxia in animals the cardiac action was benefited.

CHRONIC TYPHLITIS AND PERITYPHLITIS.

In *chronic typhlitis* and *perityphlitis* Dr. Hünerfauth, of Homburg, has found massage of great value. The cause of typhlitis is often mechanical, the stercoraceous mass remaining too long in the cœcum on account of relaxation of its muscular coat, change of its position, and chronic catarrh, against all of which massage proves a valuable preventive as well as curative measure. This treatment can have nothing to do with acute cases, or those of abscess or burrowing of pus. But for the removal of chronic thickening and adhesions affecting the cœcum and vermiform appendix or their surroundings in the peritoneum and areolar tissue, the residue of typhlitis and perityphlitis, massage has been in the hands of Hünerfauth the most effectual agent. His fifty-three cases treated in this way support him in the assertion that permanent improvement or recovery in severe cases of this sort can be obtained only by means of massage. He applied this to the abdomen for fifteen to twenty minutes twice daily; and mild cases required six to eight weeks of treatment, while severe cases

required from three to four months. With it the diet was regulated, and in some cases the mineral waters of Homburg were also used. Massage has to be proceeded with in the most careful manner in these cases; sometimes only gentle, firm pressure can be used at first; but after a brief period of this, tenderness disappears, dejections improve, and tympanitis decreases; and then firm, deep kneading can be employed to act upon indurated connective tissue and adhesions. Analogous conditions are found connected with the uterus where massage has proved of the utmost benefit after the failure of other means. With the removal of a long-continued tympanitic condition the disturbances dependent upon it cease, and the patient becomes cheerful, sleeps better, breathes easier, and the heart when disturbed resumes its natural action. Exercise must be indulged in with great caution, and dancing, swimming, and mountain-climbing must not be attempted for a long time after apparent recovery, for the right ileo-cœcal region in the majority of cases is apt to remain a *locus minoris resistentiæ*.

But while medical or surgical knowledge is necessary for the employment of massage in these cases, the method advocated by Dr. Sahli, of Bern, for the relief of habitual constipation, does not require either. He advises his patients to roll a five-pound cannon-ball on the abdomen for five or ten minutes every morning before rising. In this way he has cured nearly all his cases of torpid bowels, without any

medicine. When universal peace comes, the orator can then speak not only of turning swords into ploughshares, but of cannon-balls into aperients, and peace will then have its victories no less renowned than war.

Dr. T. Lauder Brunton reports a most interesting case of disorder of digestion in which all medical treatment had proved useless. The patient was a till, powerfully built man, who had led an active outdoor life. At one time he had suffered from asthma, but this had left him and he became subject to attacks of pain and vomiting. Dr. Brunton considered the case one of neurotic dyspepsia, while other physicians consulted regarded it as tubercular peritonitis. For two years he became more and more emaciated until he was reduced to the appearance of a living skeleton. Only once in his life had Dr. Brunton seen a man so thin, and that was at a show. In the course of eight weeks, under massage and forced feeding, the patient was a different man. His muscles had grown so that he might have joined a Highland regiment without being ashamed. The muscles when treatment was begun had almost entirely disappeared, but in eight weeks they were as hard as wood, and from having been a skeleton he became a well-developed man.* (See Figs. 12 and 13.)

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* Disorders of Digestion, by Dr. T. Lauder Brunton, page 78.

FIG. 12.—This figure, taken from a photograph, shows the condition of Dr. Brunton's patient before massage was begun. (Brunton.)

FIG. 13.—This figure, from a photograph, shows the patient's condition after eight weeks of massage and feeding. (Brunton.)

PROLAPSE OF THE SIGMOID FLEXURE INTO THE RECTUM.

Dr. T. Lauder Bruntoń once saw a case of this sort at intervals for two or three years without suspecting its nature. It occurred in a man from New Zealand who had been accustomed to a great deal of horseback exercise, frequently riding forty miles a day. He began to suffer from neurasthenia, hypochondriasis, loss of appetite, failing strength, and emaciation. He presented almost the typical aspect of hysterical girls, and was advised to undergo a course of massage. This he did for a time with very little benefit until he was sent to Dr. Eccles, who discovered the real cause of his illness, and *by the judicious application of massage to the intestines he was completely restored to health.**

The method is not described, but it probably was some sort of abdominal taxis, so applied as to pull the sigmoid flexure up out of the rectum—concerning the use of which in intestinal obstruction Dr. Humphrey ays (Lancet): "The merit of the early use of anæsthesia and abdominal taxis is, that, while eminently adapted to many, it is hardly likely to be prejudicial to any. The only cases in which the surgeon is likely to regret having employed it are those in which peritonitis simulates obstruction."

* Cavendish Lecture, June 12, 1891

MASSAGE OF THE ABDOMEN IN MIGRAINE.

That original, indefatigable, and scientific laborer in the field of massage, Dr. Symons Eccles, has made a careful study of many cases of migraine. He found that in all there was a period of gastro-intestinal inertia synchronous with the severity of the headache, in which the stomach was found to be flaccid and inert, lying in a flabby, atonic condition in the epigastric region and encroaching on the hypogastric and both hypochondriac regions beyond its normal limits in health. The sufferers all testified that the earliest warning of the attack was localized in the abdomen by symptoms of uneasiness about the stomach and intestines, nausea, sinking sensations, etc., and by visual disturbances. The relaxation of the stomach, and lack of peristaltic action in the intestinal tract, were noticeable to both patient and observer in all the cases. The exciting cause of the migraine would seem to be irritation of the gastric ends of the vagus. In addition to heredity and too mobile a state of the nervous system, patients would be predisposed thereto by absorption of toxic matters into the circulation, and by irritation of the nerve centres by the products of albuminoid decomposition, leucomaines and ptomaines not arrested or destroyed by the liver. The views of other observers in favor of the central, vaso-motor, malarial, and uric-acid origin of unilateral headache, which may be called predisposing causes, need not conflict with the coexistence of gastric disturbance as

an exciting cause. Diet, rest, and massage have proved the most efficient means of treating these cases, in the hands of Dr. Eccles. The diet should be regulated so as not to give the stomach and liver more than they can do. Rest should be enjoined to avoid overtaxing the nervous system. Massage of the abdomen, to promote circulation through the liver and gastro-intestinal tract, to mechanically propel their contents onward, at the same time improving their secretory power, should be specially insisted upon; and general massage of the whole body, to increase the interchange between the blood and the tissues, and so improve nutrition, should be employed. Such drugs as aid in preventing the formation of poisonous matters in the stomach and intestines should not be neglected. Under this plan of treatment, assimilation improved, weight increased, and headaches decreased in most of the cases, and entirely ceased for a while in some.*

MASSAGE IN IMPACTED GALL-STONES.

Dr. Wylie calls attention to the value of digital manipulation in the extrusion of gall-stones, having in two cases pursued this plan with entire success. His first case was that of a healthy woman, æt. 45, who was seized with violent pain in the region of the gall-bladder, felt sick, and vomited. A few days after, she suffered from dull aching pain in the epigastrium,

* The Practitioner, September, 1892.

with tenderness on pressure over the gall-bladder, and had deeply jaundiced skin and eyes, with violent itching of the skin. She remained in this state for over five months, losing flesh and strength. Finding medicine ineffectual, Dr. Wylie had recourse to gentle digital massage of the fundus of the gall-bladder. He could feel that he had pressed out its contents, and within twenty-four hours found a stone about the size of a hazelnut in the motions. In the next four days he continued the digital manipulations for ten or fifteen minutes at a time. The patient rapidly improved, and in a few months was quite well.—*Practitioner.*

MASSAGE IN MYXŒDEMA.

In a case of myxœdema of four years' duration, occurring in a man 56 years of age who was sent to me by Prof. Robt. T. Eden in May, 1885, the result of a course of massage every other day for six weeks was most satisfactory. The boggy, brawny, waxy condition of the tissues gave place to suppleness and freedom of motion, improved mental tone, and better hearing. Six years have gone by, and the improvement still continues. He is practically well and attends to business. Since then several cases have been reported much improved or cured by means of massage and hypodermatic injections of an extract of the thyroid gland of a sheep. A most interesting case of this kind has recently been published in the British Medical Journal by Dr. Walter Beaty. The

patient was a lady, 45 years old, who had for five or six years become more and more easily tired; speech had become slow; memory impaired; temper irritable; walking difficult; constipation increased; face swollen, waxy-looking, and anæmic; lips and alæ nasi thickened; hair thin. Hands, feet, arms, and legs were enlarged and clumsy. No trace of the thyroid gland could be discovered. Examination of the blood showed the hæmoglobin to be 70 per cent. of the normal. Five weeks of massage brought some improvement, and then hypodermatic injections of an extract of sheep's thyroid gland were also used, and more rapid improvement followed. The patient was under this treatment for twelve weeks, improving all the time; and after it was discontinued she still progressed until she was practically well—the face looked natural; the nose and tongue were of proper size; speech was rapid and easy; the hands were no longer clumsy, the grasp was firm, and her rings were loose; movements were active; hair growing thickly; memory had returned; and menses, which had come at long intervals, were now regular.

MASSAGE IN INTERMITTENT FEVER.

Dr. Alexis Férykövy, of the Austrian Army, tells us that he has treated annually about 1,000 soldiers with intermittent fever. On one occasion he ordered two of these patients to be rubbed on the back twice in one day. No quinine was given, and at the visit on the following morning he found that the attack of

fever which had previously regularly occurred had not made its appearance. The rubbing was then carried out on seventy patients suffering from intermittent fever, without the use of quinine; and in sixty cases of quotidian fever the attack did not occur any more, but in ten tertian cases the massage had no effect. The same plan was then carried out on more than one hundred cases, and in the "vast majority" the result was satisfactory.* It would seem from this that massage of the back can invigorate the whole system so as to render it invulnerable to the malarial poison. General massage would probably have a greater effect.

MASSAGE IN LEAD POISONING.

Dr. G. Tedeschi (Giorn. Intern. delle Sci. Med.) reports a case of lead poisoning cured by massage after the usual treatment had failed. By this means, he found, the urine was increased in quantity and the lead eliminated more promptly than by any other method he had employed.

MASSAGE OF THE HEART.

In a recent work on this subject Oertel places altogether too much importance upon the mechanical effect of massage of the heart over the chest walls. In order that massage might act upon the heart in the

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* Internationale Klinische Rundschau.

same way that it does upon the muscles of the extremities (which he claims it does), it would be necessary to remove the chest walls—a procedure hardly justifiable. While the patient is standing he directs that gliding pressure should be made upon the chest walls downward and inward, the benefits of which, he states, are not only referable to its influence in perfecting expiration, "but also to the direct pressure upon the heart influencing its nutrition precisely as massage benefits the muscles of the extremities." He considers this treatment indicated:

"1. When the heart muscle is weak from deficient nutrition, anemia, or corpulence.

"2. When the arterial system is imperfectly filled, and there is passive congestion as a result of insufficiency of the myocardium.

"3. When there are valvular lesions or obstruction to the circulation, the pressure of tumors, or constriction of the pulmonary orifice. Emphysema and curvature of the spine increase the demands of the heart.

"4. As an accompaniment of treatment of the heart by mountain-climbing, he also recommends it.

"It is contra-indicated in acute or recurring endocarditis or pericarditis; in acute and subacute myocarditis, the result of sclerosis of the coronary arteries; and in general arterio-sclerosis."

General massage is of great aid to the peripheral circulation, lessens the work of the heart, tranquillizes

the nervous system and induces sleep in the worst kinds of heart disease.

I have never been able to discover that massage over the heart alone has ever had any influence upon this organ save in one case. It was that of a lady, 42 years of age, weighing 175 pounds, whose adipose tissue had increased somewhat before she came to me, and she had become slightly short of breath in ascending stairs or hills. Her family and society cares were numerous, and from the wear and tear of these she sought relief, and found it in general massage. At her first visit to me she came in a carriage. She looked well. Her pulse was but 33 to the minute and dicrotic, and the first sound of the heart could not be heard. General massage did not change the character of the pulse in this case as it usually does in others, but after *masséing* the left chest over the heart for a few minutes the pulse lost its dicrotic character, and was stronger, but not increased in frequency. Next day she came on foot to my office, a distance of a mile; her pulse was 75; heart's action normal, first sound clear and distinct; and yet she said she did not feel so well as she did the day before. She had found by experience that the immediate effects of massage made her feel temporarily worse, but the after effects were very beneficial. It seems almost incredible that there could be such marked temporary functional weakness.

Prof. H. C. Wood, of Philadelphia, in a lecture delivered April 28, 1893, to the Harvard Medical School Association, said: "A lesson I want to leave with the younger men is, that in heart diseases we must never give up the case. A year or two ago I saw a case to which I called Dr. Pepper in consultation. The woman had not been out of bed for a year. It was Dr. Pepper's view that the mitral valve was practically all gone and the case hopeless. In the first place I enjoined absolute quiet. In the second place I used massage very carefully, seeing always that the strokes of the massage were directed towards the centre so as to aid in the carrying in of the lymph exudations and of the venous blood. I put the woman first on calomel, in such doses as to get her liver in action, and then I used digitalis; to-day, with strychnia with minute doses of mercurials; to-morrow, when the digitalis was losing its power a little, I slipped in strophanthus, and when strophanthus was wavering I put the woman back on digitalis with caffeine, taking care never to give the caffeine after 3 or 4 o'clock in the afternoon, so as to avoid the danger of keeping the patient awake and producing a peculiar nervous erethism. Thus working the patient along with rest and massage and very careful feeding, and mercurials and a little iron and digitalis and strychnia and caffeine, she was so far restored to health that she was able to go to Europe on a pleasure trip, and still lives in comfort."

ECLAMPSIA NUTANS (INFANTILE CONVULSIONS) CURED BY MASSAGE.

Eclampsia nutans is a name given by Sir Charles Clarke to a singular kind of convulsion in children, characterized by a peculiar bobbing forward of the head; sometimes also called Salaam convulsion, from the Arabic salaam, a salutation of respect in the East

Dr. Z. Meirelles, of Quissaman, relates (O. Brazil Med.) a case of eclampsia nutans, in which he claims to have effected a complete and permanent cure by an impromptu method of what he calls cervico-dorsal massage. The patient was a boy between four and five years old, who a few days previously had begun to suffer from well marked salaam convulsions. The nodding movements were clonic in character, the head being bent forward and slightly rotated to the right, and were continuous, following each other with great rapidity, except during sleep, when they ceased.

It occurred to Dr. Meirelles that irritation along the spine might have some effect in "re-establishing the equilibrium of the circulation in the centres of origin of the motor nerves whose dynamic functions were affected." He therefore rubbed the spine with his knuckles from above downward, and *vice versa*, with great rapidity and considerable force, from the cervical to the middle of the lumbar region, making greater pressure in the cervical and dorsal regions than elsewhere. After about a minute of this, the

movements of the head stopped. They soon began again, but a repetition of the same kind of massage once more checked them, and the little patient could not only keep his head still, but could move it in any direction in obedience to the commands of Dr. Meirelles. He was kept under observation in the consulting-room for two hours, during which time there was no recurrence of the movements.

Two months afterward there had been no recurrence of the convulsions. This was the first and only case of the kind that Dr. Meirelles had ever seen.

A patient of my own had been hemiplegic for several months. Tremor set in in the paralyzed arm, and had lasted for several months when, one day, immediately after a few minutes' percussion on the arm, the tremor ceased entirely and did not return again. One does not forget such a striking occurrence as this.

The cases of writer's cramp and allied affections in which Wolff obtained the best results were those in which spasm and tremor were the most prominent symptoms.

I knew a hysterical lady who fainted often. On one occasion when she was the guest of a strong-minded woman who did not believe in such performances, she was about to faint. Her hostess seized her by the shoulders and gave her a vigorous shaking, and told her that she would not have any such nonsense in her house; and there was none. The controlling action of the will, the inhibitory influence of the

brain and the lower centres, were aroused. A spanking on a youngster acts in the same way when accompanied with appropriate suggestion in the imperative mood.

MASSAGE IN THE TREATMENT OF SCLERODERMA.

Prof. Breda used massage in treating a patient in whom a diffused eruption of sclerodermic patches was present over the whole body after a long attack of rheumatism (Monatshefte für Prakt. Dermat.). Sixty-five sittings were given, resulting in the perfect cure of the scleroderma. The general health of the patient was also greatly benefited at the same time.

CHAPTER VII.

MASSAGE IN INJURIES OF JOINTS AND MUSCLES—SPRAINS AND FRACTURES.

Almost every one knows what a sprain is, but how few there are who can define it! In 1890, when revising my Treatise on Massage, I searched the text-books in vain for a complete definition of the word sprain, and finally concluded by constructing one to suit myself. Here it is: "A sprain may be defined as a partial and sudden displacement of two joint surfaces, followed by immediate replacement; and if the patient has fallen from a height, there will probably be contusion of the articular surfaces and soft tissues as well. The attachments of the joint on one side are stretched beyond their natural limit, on the opposite side unduly compressed. But if the patient has fallen squarely on a joint, there may be only contusion of its surfaces without strain of its attachments, and in this event the external symptoms are slight or absent while the discomfort may be great." Compare this with the definition of a sprain in the American Text-Book of Surgery, 1892, page 408: "A temporary displacement, followed immediately by return to place, constitutes a sprain." Priority?

Some years ago I published statistics of over seven hundred cases of sprain of all degrees of severity, treated by different observers, to show that

these injuries get well in one-third of the time under massage that they do without it, and with less tendency to subsequent pain, weakness and stiffness than when massage has not been employed. In general, the sooner after a sprain massage is used, the more speedy is the recovery and the more quickly are heat, pain and swelling reduced and the formation of adhesions prevented. Comfort generally follows the first treatment. Further proof of this need not be brought forward here. Even severe cases of sprain do remarkably well under immobilization and massage once or twice daily from the very first, removing the fixed dressing for this purpose. Under this combined method of treatment there is generally free use of the joint in seven or eight days.

The orthodox treatment by absolute immobility alone in these cases is as absurd as can be imagined, and has little else to support it than the dogmatism of centuries, from which it is almost impossible for a surgeon to free himself until he has been the unfortunate victim of a sprain and had it treated with massage. Supposing that any one wanted to make a well joint stiff, to what more effectual means could he resort than first to give it a wrench or sprain, then do it up in a fixed dressing so that the resulting inflammation would have an opportunity to produce adhesion of the tissues? Precisely the same plan of treatment is adopted for the purpose of closing up a hole, namely, that of exciting adhesive inflammation and

then putting the parts at rest; and unfortunately this plan sometimes closes the cavity of a joint as well. The mode of using massage in these cases I have frequently described and demonstrated, and need not do so here. Suffice it to say that it is not by beginning on the seat of the injury, as is generally supposed.

But sprains are sometimes complicated with fractures near and into joints, and of late years massage and movements, passive and active, have been used in these cases with advantages over the ordinary methods. Dr. John Chiene, Professor of Surgery at the University of Edinburgh, very appropriately calls attention to the interesting fact that no fractures heal more kindly and quickly than broken ribs, in which it may truly be said that during the whole process of cure the act of breathing is keeping up a constant gentle movement, a nature's massage, which in no way interferes with the union of broken bone, but rather helps it. In intra- and para-articular fractures the French surgeons Championnière, Tripier, and Rafin have found that complete immobilization is accompanied with danger, whereas massage acts well from the first and can be used with other means. Their experience has more recently been confirmed by Prof. Landerer of Leipzig, Dr. Kendal Franks of Dublin, and others.

In a recent lecture on Delirium Tremens, Prof. David W. Cheever says: "It may seem incredible, but I have known instances in which the patient removed

the plaster cast when not thoroughly watched. To be sure, he had very little of his finger-nails left in the morning. Also, more remarkable, this patient finally got a good leg, although he had a fracture in the middle of the femur, and we expected almost anything to result from the way in which he tossed about for a number of days."

The dangers or immobilization are, stiffness of the joints and atrophy of the muscles; and the anæmia of the muscles (ischæmia) caused by fixed dressings may be mistaken for neuritis. It has been demonstrated by Kraske that the application of a rubber bandage to the leg of a rabbit for six hours has produced *vitreous* (hyaline) degeneration of the muscles from which they cannot recover. The advantages of massage are that it promotes absorption of effused products, prevents stiffness of the joints and atrophy of the muscles, and favors repair. It should be done once or twice daily in these cases. M. Championnière found that massage relieved pain, as most observers do who know how to employ it, but M. Rafin states that its application was painful. The manner of employing it would probably account for the difference. This is not stated. In my Treatise on Massage I have given full directions how painful, swollen, and tender tissues can be gradually approached by working first on the adjacent healthy parts. Those cases in which there was no displacement did well under massage and passive motion without immobilization.

Those in which there was displacement of the fracture had massage at first to hasten absorption, then a retentive dressing for the shortest time possible to make sure that the displacement would not return, and, after this, massage and passive motion for the restoration of mobility. As soon as consolidation had taken place it was found that motion was free and easy. Fracture of one of the bones of the forearm or leg, where the other acts as a natural splint, as of the lower end of the radius or fibula, is very favorable for massage. Dr. Franks considers transverse fractures of humerus or femur, or of both bones of leg or forearm, also favorable for this treatment. The splint is removed once or twice daily for this purpose, and recovery seems to take place in about two-thirds of the time required without massage. Of cases reported by Rafin, recovery took place in three of fracture of fibula in 13, 22, and 13 days, respectively; in two of the radius, in 19 and 20 days respectively; in a double fracture of the ulna, in 27 days; in a fracture of the external condyle of the humerus extending into the joint, in a child, in 9 days; in a case of fracture of both malleoli in a child, in 15 days; in a case of fracture of both malleoli with subluxation of the foot outwards and backwards, in an adult, in 40 days. In a case like the last, few men would have either the hardihood or the patience to use massage until union had taken place.

Dr. Penrose, of the Marine Hospital at Norfolk,

Virginia, treats fractures of the lower end of the radius by means of a splint extending to the middle of the palm, which he allows to remain for the first three days only; and after this he uses a splint which extends only to the wrist, so that motion may then be permitted and stiffness prevented. The results are said to be excellent.

My friend and former pupil in massage, Dr. E. S. Boland, reported a case of simultaneous intra-articular fracture of both olecranon processes, and showed the patient at the surgical section of the Suffolk District Medical Society, April 5, 1893. "The patient was a young lady of 19 years, in good health. She was first seen by Dr. Boland twenty minutes after having fallen on both elbows. He found transverse fracture of the right ulna in the depth of the sigmoid notch, and a similar fracture of the left with a splitting of the detached olecranon at an angle to its long diameter. These fractures all opened into the joints; and this diagnosis was confirmed by a consultant. The skin was much bruised and excoriated, but not broken. The arms were dressed with well padded, long, straight splints, in which openings were left at the elbow for soothing applications. Passive motion and massage was begun on the fourteenth day, for which the dressings were removed, and by the twenty-fourth day they were left aside. The fractures were carefully fixed with one hand, while the other did massage and gradually increasing passive motion; and to the early use

of this treatment is doubtless due the perfect recovery of this patient. Seven months later she was taking free exercise with chest weights and Indian clubs, which she did in every possible direction before the Surgical Society, April 5, 1893, at which I had the pleasure of being present. Dr. Gay, the President, declared 'the result admirable—could not be better.' There is firm bony union of all three fractures, the lines of which can be felt. But motion is perfect in all directions, and the patient's arms are stronger than before the accident. On account of the more severe bruising of the external tissues over the left (worse injured) olecranon, it was impossible to secure as much coaptation as seemed desirable. Nevertheless this joint began to improve first, made quicker progress, and reached complete recovery three months before the other. Excoriation on the outside and effusion in the inside of this joint were for a time alarming. The patient did everything in her power to expedite recovery, notwithstanding that she had an impending law-suit for damages which put a premium on slow progress or permanent disability."

A patient upwards of 70, at present under my care, who has been neuralgic for many years, fell and dislocated her right wrist and fractured the lower end of the right radius. The dislocation was reduced the following day, and the arm put in a splint. One week after the accident her surgeon consigned her to my care for massage, under daily applications of which

the heat, pain and swelling disappeared, and at the end of three weeks the splint was left off entirely and only a roller bandage kept on; and at the end of four weeks (the present time) the patient is doing remarkably well, and a tendency to stiffness is being counteracted by an occasional massage.

In *transverse fracture of the patella*, even when good union has been obtained either by immobilization or by suturing of the fragments, or by fixation of them with Malgaignes' hooks, the resulting stiffness of the knee-joint, atrophy of the quadriceps extensor muscles, and impaired motion may cast a shadow of gloom over the most careful treatment or the most skillful operation. But the lesson taught by cases in which the fragments have remained widely separated and yet been accompanied by good motion, has not passed unheeded. Prof. Tilanus, of Amsterdam, treats cases of fracture of the patella without immobilization, using instead compression, massage, and early movements of the joint, leaving consolidation to take care of itself, for union is by no means certain under the best of care. In this manner the effusion is quickly dispelled, and atrophy and stiffness prevented. His patients were encouraged to walk after the first week. Six cases that Prof. Tilanus treated in this way could walk very well in fourteen days, according to his own statement. Rafin treated one case in this manner, and the patient could walk perfectly in forty-two days, experiencing only slight difficulty in descend-

ing stairs. The seat of the fracture could then be felt with difficulty, being marked only by a slight depression of the skin, and the leg could be flexed within two finger-breadths of the thigh. In fracture of the patella and olecranon Dr. Landerer uses massage from the first, as he considers this safe and simple, affording good functional results in four or five weeks, when the patients are again able to use their limbs. In fracture of the anatomical neck of the humerus the patient carries the arm in a sling during the first eight days, and then passive motion is begun.

Dr. Wagner, a regimental surgeon of the Austrian Army, states that he has obtained astonishingly good results in five cases of fracture of the patella which he treated with massage, passive and active movements, but without even the application of a bandage. His method is somewhat as follows: The patient is put to bed, and the affected limb stretched on a simple inclined plane or on an adjustable wooden splint so that the heel is elevated. In the first three or four days an ice-bag is placed upon the swollen and painful knee. As early as the fourth day, massage may be begun, not only over the entire extent of the quadriceps extensor muscles, but also over a large portion of the knee-joint. This is done daily, and is soon followed by passive movements. As soon as possible without causing great pain, the patient himself begins to move the joint, and after the lapse of fourteen to twenty days may attempt to walk on

crutches, and in six weeks is usually able to walk without support. Should the fragments be widely separated, Wagner recommends subcutaneous suture, but even here massage and gymnastics cannot be begun too early. In fine, by means of massage and movements the indications in every case are largely met, and these are: the removal of the effusion so as to allow the fragments to come closer together, the favoring of repair and the formation of callus, the prevention of atrophy of the quadriceps extensor and shriveling of the capsule, and the restoration of motion. It is needless to state that these manipulations should be undertaken only by some one having sufficient anatomical and surgical knowledge.

It is worthy of notice that the principal muscles of the quadriceps extensor that effect extension of the leg are the vastus internus and the vastus externus. The insertion of these on the lateral aspects of the patella extends much lower than is generally supposed, and affords leverage to extend the leg when a fragment of the patella is detached above their insertion. Rupture of the rectus femoris alone has little or no influence in hindering walking after the immediate effects of the injury are recovered from. Dr. Kummer of Geneva, and Dr. Kaufmann of Zurich, have each performed total extirpation of the patella for disease of that bone without impairing the patient's gait or interfering much with the movements of the knee-joint when the latter was healthy. Slightly

weakened power of extension of the leg was the only feature noticeable on close examination.

After union of any solution of continuity, whether of bone, muscle, or nerve, massage and movements are in order, and, even while repair is going on, the mobility of joints may be still better secured by altering the position of them at each dressing.

RELAXATION OF LIGAMENTS

Is often erroneously diagnosticated, after the improvement of a joint from the acute symptoms of disease or injury. It is much more frequently the case that the muscles moving it are atrophied and relaxed in consequence of the necessitated disuse which thus allows too great traction upon its ligaments. Massage, carefully regulated movements, and faradization will restore the nutrition and tone of such muscles, and, if the disturbance of the joint has disappeared, the limb can thus be got well. In three cases of this kind I had the pleasure of training the affected muscles as mentioned so that from being totally unable to extend the affected leg at all, in a few weeks they could hold it fully and voluntarily extended for seven, nine, and ten minutes respectively. The first of these was a stout elderly lady who still had the remains of an old synovitis when she began this treatment, under which she fully recovered. The second was a gentleman of 63 years who had developed a rheumatoid arthritis of his left knee in consequence of an injury; and, though the

peri-articular thickening disappeared and the quadriceps extensor muscles improved so that he could hold the leg extended for nine minutes, yet grating of the articular surfaces remained and locomotion was much impaired. The third was a long-levered, awkward woman who had for many years suffered from relaxation of the quadriceps extensor to such an extent that it allowed the patella to slip externally without the power of voluntary or involuntary replacement, causing her many bad falls. When she had gained strength sufficient to hold the leg extended for ten minutes, she had correspondingly good use of the limb, but for security I still made her wear a few turns of roller bandage to keep the patella *in situ*. Let any of our readers take his watch and try to hold his leg and thigh fully extended without support for one or two minutes, and he will appreciate what was accomplished in these cases.

MASSAGE IN PAINFUL FLAT-FOOT.

I can testify to the value of massage in painful flat-foot, having used it in the case of a stout, elderly lady, the arch of whose foot had been gradually sinking so that when she came under my care she was at the same time, by the advice of an orthopedic surgeon, having a metallic support made to hold up the arch. The beneficial effects of massage and resistive movements were speedily apparent, and the result was that the support was never worn at all, as she has got

along very comfortably with her usual shoes ever since, now fifteen years altogether.

The observations of Landerer, of Leipzig (Berliner Klin. Woch.), go to show that the muscular system is necessary for the preservation of the bodily form. He believes the normal activity and tension of the muscles to be the great cause of preventing alteration of structure. Bandages alone, without the aid of the muscles, cannot prevent deformity. In flat-foot he seeks to strengthen by means of massage all those muscles which are concerned in the support and preservation of the arch of the foot. In accordance with this view, he has treated the muscles alone in eight cases of painful flat-foot, with excellent results. In some of these the form of the foot changed, the arch resuming its natural shape.

CHAPTER VIII.

M. CASTEX'S CLINICAL AND EXPERIMENTAL STUDY OF MASSAGE IN AFFECTIONS OF JOINTS AND MUSCLES.

A clinical and experimental study of massage, of more than usual interest and value, is that of M. Castex in a series of articles in the Archives Générales de Médicine in 1891 and 1892. His observations are divided into five categories:

1. Contusions upon a limb at a distance from a joint, and contusions upon the joint.

2. Sprains of wrist and ankle and neck.

3. Dislocations of the shoulder.

4. Fractures, some of which were *masséed* from the first, and others (more serious) after a certain period during which they wore a fixed dressing.

5. In muscular atrophies of diverse origin.

Excellent results were obtained in all of these affections. In a case of severe contusion of the arm from the kick of a horse, after the patient had been in bed for four days massage was used three times in three days, and the man then resumed his occupation. Contusions of joints when treated from the first with massage were quickly relieved, and subsequent serious consequences which are so apt to follow, such as atrophy, paresis, contraction, and stiffness, were prevented. But when massage was used in old cases of

muscular atrophy consecutive to joint injuries, no increase of muscular tissue followed; the muscles became suppler, but were still thin and deficient in energy. If M. Castex had combined passive and active movements with the massage, he would probably have obtained growth of wasted muscles. He found the faradic and galvanic currents of benefit in promoting muscular growth. Muscular contraction from the faradic current is another form of motion.

Numerous theories as to the cause of muscular atrophy from joint injury have been considered and abandoned. The most probable and most generally accepted is that of reflex action. The injury to the joint starts up a slight or great arthritis; the articular nerves are irritated; this irritation is transferred to the spinal cord; the nerve centres affected act in turn upon the centrifugal muscular nerves, and these determine at their other ends the muscular atrophy. M. Deroche has repeated seven times, and always with the same results, experiments which were done for the first time at the College of France by MM. Raymond and Onanoff. He divided the posterior roots of the three last lumbar nerves on the left side in some dogs and rabbits. After cicatrization had taken place he assured himself that anæsthesia was complete in the lower limb of the left side, from the thigh to the knee, so that irritation of this region was not felt. An arthritis was then set up in both knees by introducing a thermo-cautery into them. No pain was felt in the

left knee. Three months afterwards the animal is killed, and in both knees the lesions of arthritis are found, *but the muscles of the thigh of the left limb are normal; of the right, atrophied.* Prof. Simon Duplay and M. Cazin have made a careful study of this subject in the same manner. Under the microscope they found that the articular nerve filaments were always inflamed, but the large nerve trunks and the spinal cord showed no appreciable change, and the results of examination of the muscles were negative. They therefore conclude that muscular atrophies consecutive to joint injuries consist of simple atrophy—and that this can only be explained by a dynamic action, a simple reflex due to irritation of the terminal filaments of the articular nerves. M. Deroche found that the muscular atrophy was due to diminution of interfibrillary substance, and that there was an ascending degeneration of the posterior columns of the same side. Hence the inference is justifiable that massage acts to prevent muscular atrophy by maintaining an influence, a movement or something, in the muscles which the spinal cord is for a time incapacitated from imparting to them. Massage should be applied from the beginning to prevent their atrophy.

Massage is sometimes of value as an aid to diagnosis. By the removal of the swelling, one can more clearly make out the state of the tissues and whether a fracture exists or not. In a fracture of the elbow where the diagnosis was obscure even after the re-

moval of the splint, massage quickly disengorged the tissues and restored them to their natural suppleness, and then it was evident that the inferior extremity of the humerus was changed in form, that the bones of the forearm in flexion butted against a callus, and that to seek for further improvement than semi-flexion was illusory.

The good results of massage in injuries of joints and muscles in human beings M. Castex also obtained experimentally, and studied still further in dogs. He severely bruised the corresponding muscles in each leg of some dogs, the joints in others, sprained the same joints in each leg of some dogs, and dislocated and fractured them in others. He always chose the most injured limb for massage, and the other had no massage but was left to the natural evolutions of the injuries. The effects, immediate, consecutive, and remote, were carefully noted in the presence of competent observers who were not told which leg had been *masséed*. The experiments were made in the laboratory of Prof. Richet. The dogs were kept for five or six months and then killed, and the muscles, vessels, and nerves of the regions that had been injured were examined under the microscope, and also the corresponding parts of the spinal cord. The massage was done either immediately or very soon after the injuries; in the cases of the dislocations also as soon as they were set, and always with marked relief to the swelling, pain, and stiffness—so much, indeed, that

after a few massages the dog had full use of the leg that had been *masséed*, whereas the leg that had not been *masséed* remained swollen, stiff, and lame for a long time. The details are amazingly interesting, but space forbids mention of more than one of the experiments. The two shoulders of a large watch-dog were dislocated by inward flexion. The head of the humerus of each was plainly visible under the skin, showing a luxation forwards and inwards—intra-coracoid. They were easily reduced by traction. Five minutes of massage were at once given to the right shoulder, and after this a figure-of-8 bandage was applied to both. He had massage five minutes daily to the right shoulder. For the next three days the dog moved with difficulty. The right shoulder was still painful to the touch, but the dog stood firmer on this side. On the fourth and subsequent days all sorts of pressure upon the *masséed* shoulder were borne without pain; but when the other shoulder was pressed, the dog growled and attempted to bite. Six days after the dislocation he supported himself well on the *masséed* limb but held the other up, and the *non-masséed* shoulder was swollen and painful. Both shoulders remained reduced, in spite of passive motion that might dislocate them. On the eighth day the dog walked well with the *masséed* limb, but kept the other up—the latter was still swollen and painful, and there was some crepitation in the joint. Thirteen days after the injury the dog took only an occasional

step with the *non-masséed* limb; and two months later it was in about the same condition, while he made free use of the *masséed* limb in running and walking. There was then atrophy of the muscles of the left

FIG. 14.—Bruised muscle without massage. *f*—Muscular fasciculus. *c*—Intermuscular connective tissue.

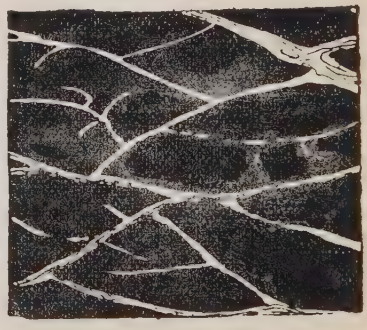

FIG. 15.—Bruised muscle after massage. *f'*—Muscular fasciculus. *c'*—Intermuscular connective tissue.

Fig. 15 shows that the natural size of the intermuscular connective tissue and the muscular fibres has been preserved, whilst Fig. 14 shows the intermuscular tissue thickened and the muscular bundles thinner and compressed. (After Castex.)

shoulder (not *masséed*), which was evident by the prominence of the spine of the scapula.

Evidence in favor of the early use of massage in dislocations, while being careful not to disturb the joint, is gradually accumulating. Not only M. Castex, but also MM. Fége, Archambaud, and others,

have reported more favorable results from its application from the first day than when it has not been used. Passive movement should not be given until the patient has discovered that he can make a little voluntary motion. Fifteen to twenty days of this treatment seem to be all that is necessary.

Examination of the muscular tissue of dogs from the side that was not *masséed* showed that the connective tissue was thickened, with interstitial hæmorrhages, marked especially in the peri-muscular cellular tissue—in other words, the internal and external perimysia were infiltrated with blood, and also the fascia outside of this. The transverse striæ were effaced in many places, whilst the longitudinal striation, which is not seen normally, was very marked. The muscular tissue from the similar region of the the other side, that had been *masséed*, was found to be normal in every particular. (See Figs. 14 and 15.) The small blood-vessels were perfectly natural from the *masséed* side, but those from the *non-masséed* side presented a hyperplasia of their external coat. The nerve filaments, normal in the *masséed* side, showed in the *non-masséed* evidences of perineuritis and interstitial neuritis. The perineurium was at least three times as thick in the *non-masséed* side, in the interior of which the new-formed connective tissue compressed the nerve fibres. (See Figs. 16 and 17.) The change in the nerves was more marked than that of the vessels.

These experiments of M. Castex illustrate more than ever the saying of old Arrian in the year 243, that "Great is the advantage of rubbing to the dog not less than to the horse, for it is good to knit and to

FIG. 16.—Injured nerve without massage. *p*—Perineurium. *t*—Nerve tubes. *c c*—New-formed connective tissue. Castex.)

strengthen the limbs, and it makes the hair soft and its hue glossy, and it cleanses the skin from its impurities. One should rub the back and the loins with the right hand, placing the left under the belly, in order that the dog may not be hurt by being squeezed from

FIG. 17.—Injured nerve with massage. *p'*—Perineurium. *t'*—Nerve tubes. (Castex.)

In Fig. 17 all the nerve elements are of normal appearance, whilst the same nerve from the other (*non-massed*) side shows its perineurium thickened, and inside of this are dépôts of new-formed connective tissue which crowd and compress the nerve fibres.

above into a crouching position; and the ribs should be rubbed with both hands; and the buttocks as far as the exremities of the feet; and the shoulder-blades as well. And when they seem to have had enough, lift her up by the tail, and, having given her a stretching, let her go. And she will shake herself when let go, and show that she liked the treatment."

CHAPTER IX.

MASSAGE IN CHRONIC ULCERS—ON THE SOUND SURFACE IN BURNS—FOR PLEURITIC EFFUSION—FOR INCONTINENCE OF URINE IN FEMALES.

In 1873 I used massage in a case of paraplegia sent to me by the late Prof. Calvin Ellis. The patient had large ulcers on his nates, and Dr. Ellis thought that massage might do them good also. The suggestion seemed to me very unreasonable and extraordinary, as the nervous influence over nutrition was doubtless as much at fault as the long-continued pressure. But the Professor's thoughts were in the right direction, though benefit did not result in that case. Dr. A. E. Millard, surgeon to the Victoria Infirmary at Glasgow, has of late been using massage with favorable results in chronic ulcers of the leg.* These are apt to arise from some slight accident to a limb in a condition to break down at the slightest provocation. The parts are in a state of passive stagnation or engorgement, the result of which is a hyperplasia of the connective tissue and thickening of the parts around, as shown by the denseness and hardness of the soft tissues. The blood-stagnation renders the

* Glasgow Medical Journal, July, 1891.

new-formed tissue, as well as the old, of low vital power, so that an ulcer once formed is likely to extend. The venous engorgement and new tissue cause mechanical obstruction, preventing the entrance of fresh arterial blood to the parts and the exit of effete material by the lymphatics.

The indications then are clearly the relief of the engorged state of the veins and of the obstruction in the lymph vessels, the readmission of arterial blood to the parts, and the removal of injurious influences from the surface of the ulcer. The recumbent position and the elastic bandage have proved far inferior to massage, which drives on the venous blood and lets in the arterial, forces out the contents of the lymphatics and allows the entrance of worn-out materials. Besides applying massage to the limb, Dr. Millard also applies it to the ulcer—in the following manner: A piece of jaconet, large enough to be held tightly around the limb, is dipped in a 1:2000 bichloride-of-mercury solution, and then placed with its non-glazed side over the ulcer and surrounding parts. The smooth surface is dried and a little vaselin applied to it, so that the palmer surface of the hand can glide over the ulcer, which thus shares in the massage with the surrounding parts. After each daily massage the ulcer is washed with the same bichloride solution, and a piece of boracic lint about the size of the ulcer is dipped in the solution and placed on the sore and then covered with a piece of gutta-percha

tissue. As the ulcer heals, the mercury solution is changed for boracic acid lotion.

Dr. Millard reports that the immediate result of this has in every way proved beneficial, and its remote effects were equally valuable. The cicatrix of an ulcer that had been *masséed* was well vascularized and much less likely to break down than when the ulcer had sluggishly skinned over. After a time the patient can continue the treatment himself, so as to keep up a healthy action. Where these ulcers are associated with varicose veins, massage ought to be applied to relieve their passive engorgement.

Improvement is said to show itself at once, and is most marked during the first week or two. The heaped-up skin-edges disappear, and a sloping blue line is seen, and the floor of the ulcer shows healthy granulations. The adjacent skin early becomes white or mottled, indicating the emptying of the congested venules. The skin becomes more pliable; the cicatrix is well organized and less likely to break down than where massage has not been used.

Dr. Herbert, Civil Surgeon at Aden, in Southern Arabia, on the Strait of Bab-el-Mandeb, tells us that he has to treat numerous ulcers of feet and legs, some of which are quite incurable, probably on account of their origin being from want of vegetable and animal food, though few of them are actually scorbutic. The following case illustrates the varied means that have to be used. A slightly scorbutic patient had an ulcer

two inches long by one and a half inches broad on the dorsum of the foot. The signs of scurvy soon cleared up, but in spite of the most varied dressings, elevation, poultices, and free, deep incisions, after two or three months the ulcer remained of much the same size. There was a broad dense margin of cicatricial tissue, and outside of this the skin of the dorsum was smooth, pigmented, and immovable on the underlying structures. Massage was then started for half an hour twice daily, with simple dressings. The patient himself was made to knead and rub the surrounding skin so as to soften and loosen it. The ulcer at once began to improve, at first rapidly and afterwards more slowly, and in little over a month it had quite healed, though the skin was still pigmented and somewhat glossy and bound down. Dr. Herbert remarks that this seems such a common-sense mode of proceeding as to be scarcely worth mentioning; yet it is one that is very apt to be overlooked, and shows the need of departures from routine practice. In very large ulcers of the leg which have partly healed, and so become surrounded by a more or less dense and extensive superficial cicatrix, manipulation has been of much benefit, softening the tissues and improving the defective blood-supply (British Medical Journal, No. 1563, page 1362).

No man in his senses would use vibration, by hand or otherwise, over an ulcer, even when this is covered by a piece of linen and gutta-percha, as recom-

mended by Arvid Kellgren. There are certainly very few patients who would submit to such painful nonsense.

A friend of mine, after a long residence in Java, had an intractable ulcer on the outside of the leg, which defied both medical and surgical skill, but finally got well under the manipulations of a native masseur, who there goes by the name of *Toekan-Pidget*, the procedure being called *Pidget* in the language of the Malays.

MASSAGE OF THE HEALTHY SURFACE IN BURNS.

Surprising as it may seem that massage should be of benefit in chronic ulcers, what was my astonishment to read in the Revue d'Hygiene Thérapeutique the title of an article on a *Second Case of Cure of Extensive Burn by Massage and Creolin*, by Dr. Casati. It was that of a child 15 months or age, convalescing from a grave gastro-intestinal catarrh, who had fallen into a bucket of boiling water and been burnt from above the umbilicus to the soles of the feet, but not everywhere to the same degree—in some parts to the third and fourth degree. Massage was repeated every two hours upon the healthy surface of the body, and lime-water and olive oil with 5 per cent. of creolin was applied to the burns, and cold to the head; and the best results were obtained. The massage "triumphed over the comatose condition from the first moment," and, it is thought, prevented any bad effects

upon the meninges and upon the lungs. Dr. Casati considers massage a powerful means for preventing the consequences of burns. Evidently the treatment prevented intestinal complications also, to which the author does not allude. Creolin he regards as a powerful antiseptic devoid of toxic action. Still it is evident that massage must be much better suited for chronic affections of nerves, muscles, and joints than for ulcers, burns, or diarrhœa.

MASSAGE FOR PLEURITIC EFFUSION.

Several cases of pleuritic effusion in which the absorption of the fluid was accelerated by percussion upon the chest walls, have been reported by Dr. Schlegel in the Allgemeine Med. Central-Zeitung. The ulnar border of the hand was used, striking at the rate of two blows every second, or 600 in five minutes. Two *séances* were given daily. It is astonishing how far out of the way enthusiasm will sometimes carry one, for Schlegel believes that percussion might be quite as useful for promoting absorption in the intracranial cavity and the spinal canal, which are not directly accessible to manipulation; but as the walls of these cavities are unyielding, the blows would have to be so strong that the patient would probably object.

Massage for pleuritic effusions also has an advocate in Dr. Poliakow (Wien. Med. Presse), who has employed it in ten cases of primary pleuritic exuda-

tions, seven of which were purely serous and three sero-fibrinous. The manipulations were made in the direction of the lymphatics of the affected region radiating towards the axilla. The treatment was begun by light *effleurage*, and soon brisk rubbing was resorted to, followed by *tapotement*. Sittings were daily for ten or twenty minutes. The exudations disappeared in from ten to twenty days. Poliakow seemed to rely on the irritating effect of brisk rubbing rather than the sedative influence of massage proper, or deep manipulation. The chest pains were relieved, the muscles invigorated, and the volume of the respiratory movements increased, all of which exerted a favorable influence toward the absorption of the exudation and the distension of the compressed lung.

But massage is much more effectual on the large lymph cavities directly accessible to pressure, such as the peritoneal cavity, the synovial cavities of joints, and the cavities of the tendon sheaths, which are in communication with the lymphatics of the surrounding parts by stomata or minute openings, as all the other lymph cavities are.

MASSAGE FOR INCONTINENCE OF URINE IN FEMALES.

This is the most unexpected use of massage that could be conceived of, and yet there is sufficient testimony that patients have been speedily cured in this way when other means had failed, so that the end justifies the means. Massage of the abdomen alone I

have frequently found beneficial in cases of want of tone of the bladder as well as of the intestines. Massage of the uterus and its surroundings has been sufficiently dealt with in my Treatise on Massage, to have received the following notice from the Dublin Journal of Medical Science, p. 146, 1891: "Those who objected so strongly a short time ago to the employment of massage in these regions would do well to read this chapter, and to bear in mind the author's observation that 'massage of the pelvic organs should be entrusted to those alone who have clean hands and a pure heart.'" The New York Medical Record, Nov. 8, 1890, said that this chapter was worse than ignorance, while on the next page of the same number it spoke highly of the same treatment emanating from a Massage Primer.

In the Dublin Journal of Medical Science, Dr. W. S. Bagot, physician to the Rotunda Hospital, has reported three cases of incontinence of urine in women cured by Brandt's method, some of the details of which he has omitted as useless. The most essential part of this method was the manipulation of the neck of the bladder by the finger in the rectum or vagina. In children the finger should be used in the rectum. Percussion over the lumbar and sacral regions, and exercise of the adductors of the thighs, were omitted as unnecessary. The "bladder-lifting," so called, which is similar to the "uterus-lifting," was also omitted, for the reason that Dr. Bagot had observed

during laparotomies that it would be impossible to seize the bladder when in an empty state and elevate it by Brandt's manœuvre; and were the bladder full, or partly so, such a procedure could not be done, owing to the sensitiveness of the organ. The uterus would be still more inaccessible to this procedure, which is thus described: "The patient lies on a low couch in the dorsal position. The operator stands in front of the patient, with his right foot on the floor and his left knee on the couch. Then, bending over the patient, he extends his arms, and lays his hands, with the ulnar surfaces approximated and the finger-tips directed towards the pubes, on the woman's abdomen, in the hypogastric region. The fingers, pressing strongly, then make a vibratory movement as if they were about to elevate the bladder out of the pelvis."

This position and procedure are as absurd, ridiculous, and disgusting as can be imagined, and it is a wonder that Anthony Comstock has not seized all the books containing pictures of it and cast them into the fire, where they belong. Were a prize offered for an obscenely awkward position, this would take it. If this procedure were of special advantage, why in the name of decency could not the operator stand with both feet on the floor and turn his back to the patient, and then his hands would fit easily and naturally on the patient's abdomen with their radial borders approximated. There is no need of full pictures of male and female to represent this. A brief sketch of the

pelvic organs and of the hands in position would answer.

Brandt and Boldt have reported cases of incontinence of urine treated successfully by manipulation of the neck of the bladder, etc. A lady who had been treated by some of the most eminent specialists by dilatation of the urethra, electricity, etc., came to Brandt, stating that for the past six years she had been unable to retain her water when standing. After eight days' treatment she was discharged cured, so it is said. Boldt reports two cases of enuresis in children cured by this method in three days.

Dr. Sänger's method is somewhat different. It consists in dilating the vesical sphincter. The patient lies on her back. The urethra is disinfected, and a metal female catheter is passed into the bladder for a distance of 5 to 7 cm., so that its point is on a level with the orifices of the ureters. The tip of the right index finger is kept on the mouth of the catheter and prevents the urine from flowing off, while the index and middle fingers of the same hand steady the instrument. With the index and middle fingers of the left hand upon the catheter near the urethral orifice, the operator makes springy and forcible pressures downwards and laterally, so that the urethra becomes during these movements widely open and urine flows out by the side of the catheter. Not only the sphincter of the bladder, but the muscularis of the urethra, thus becomes strongly stretched. Further massage

can also be done by a finger in the vagina or rectum pressing against the catheter. The stretchings are usually not painful, but, if they are, the urethra can be brushed with a 10-per-cent. solution of cocaine. Ten or twelve *séances* usually cure a patient, and these are given at first twice a day. Eight to twelve stretchings are made alternately downwards and laterally at each sitting. Dr. Sänger is of the opinion that the cause of this affection is a weakness of the sphincter muscle of the bladder, and the centre for micturition is also implicated in a negative manner. The irritation of the stretching of the sphincter causes it to contract more strongly both in a direct and reflex manner, and hence a certain degree of work-hypertrophy may be set up. This method may be of value in other cases of paresis of the bladder depending on peripheral and central causes. It is not indicated in abnormal dilatation of the neck of the bladder and the whole urethra with incontinence. By this method Dr. Bagot has treated two cases. One of these was a woman 40 years old, who had had two children and no miscarriages. She had suffered from an almost complete prolapse of the uterus, which Dr. Bagot cured by Brandt's method of pelvic massage, but this did not cure the involuntary passage of water. Sänger's method was then used, once daily for a week, and then twice a week for two weeks longer, and she gained complete control over her bladder, and did not relapse.

There is still another method of treatment which is said to prove extremely valuable when used in suitable cases: it is massage by distension of the bladder with warm water, attention having been drawn to its benefits by Braxton Hicks, Marion Sims, Jr., and Nissen. It is of use in cases of contraction of the bladder following long-continued incontinence, as a result of which the holding capacity of the bladder is much diminished.

CHAPTER X.

MASSAGE IN SCOLIOSIS (LATERAL CURVATURE OF THE SPINE)—MASSAGE OF THE EAR, ETC.

The employment of massage in properly selected cases of lateral curvature of the spine has been very successful. The experience of Dr. Landerer, of Leipzig, in this affection is especially worthy of consideration. Habitual scoliosis he regards as that arising from superincumbent weight pressing bones and joints in wrong directions, and, if uncorrected, ultimately producing anomalous growth. The cause of this is muscular weakness, and it is necessary to distinguish this from other forms. It is in the earlier stages of this kind of lateral curvature that massage has been found to speedily bring about recovery; and in the later stages, where the deformity has become fixed, intercostal neuralgia and painful tension of the muscles are relieved and the patient made comfortable by the same means.

Slight lateral curvatures of the spine are frequently found in otherwise well formed people, but these might be regarded as physiological or natural, for they give no trouble so long as the muscles are strong and active. Still amongst classical statues this form of scoliosis does not appear. In Swabia, the birthplace of Dr. Landerer, women and girls carry

heavy loads upon their heads up high mountains, but, in spite of this, scoliosis is seldom met with amongst them. On the contrary, very prettily formed figures are almost exclusively found, due in great part to this exercise. The maidens of Capri also carry heavy weights upon their heads and are remarkable for their faultless forms. The muscles are thus made powerful to oppose strong lateral resistance.

In incipient scoliosis the spinal column is exceedingly flexible, and this great mobility should be regarded as the first sign of lateral curvature, especially when accompanied by flat back.

Autopsy of scoliotics shows atrophy and fatty degeneration of the muscles of the back, especially of the concave side, but this must be in severe cases that have existed a long time.

The bustle or *tournure* is an artificial deformity which has long been fashionable with ladies. But when this occurs as a real deformity—anterior curvature or *lordosis*—it is regarded as a great misfortune, and the resources of orthopædic surgery are earnestly invoked for its correction. These are massage, gymnastics, spring supports, and suitable medication. But anterior curvature in the lumbar region is common in some races, as amongst Cuban women and the inhabitants of Terra del Fuego; and even in some Europeans and Americans, there is an exaggeration of the natural antero-posterior curve which need not be mistaken for lordosis.

In cases of lateral curvature from weak muscles massage goes further than gymnastics, and what the latter accomplishes slowly massage does in a direct manner by the hands of the surgeon. With cases of scoliosis in the first stage, which permanently improved in a few months under Dr. Landerer's treatment, the children felt stronger and steadier in the back and held themselves more erectly after a few *séances*. The immediate effect of massage was quite evident, yet part of the improvement disappeared within a short time, but gradually the gain became lasting. The method employed by Landerer is as follows: The child is laid upon the abdomen, the trunk bare to the lower half of the crests of the ilium, the arms stretched forward. The extensors on both sides of the back are percussed with the balls of the little fingers from their origin on the pelvis upwards to the neck, at first gently, then more vigorously. The concave side is percussed more strongly than the convex. The muscles on the sides of the trunk, so far as they are connected with the spinal column, come in for a share of the same. Then the extensors of the trunk are stroked with the fingers held in a perpendicular manner.

I do not see why percussion should be used more energetically on the concave side, unless it be carried to an extreme degree so as to tire out the contracted muscles and thus cause them to relax. Percussion has much the same effect as faradization, and can be

used in moderation to stimulate muscular contractility. My method of proceeding in such cases is somewhat different; for, seeing that lateral curvature may not only be favored but actually produced in those predisposed thereto by always sleeping on one side, with high pillows under the head, a great part of the treatment should consist in having the patient lie upon the opposite side so as to reverse the curves. It is better that most of the massage should be administered with the patient in this position, for massage and percussion help to relax contracted muscles when they are stretched, and stimulate the contractility of relaxed muscles. The insertion of muscles implies their attachment to the more movable parts, and as their returning circulation almost always runs from their insertion to their origin, it would seem much better to proceed with the massage in this direction, from the neck to the pelvis. Deep manipulation, rapid pinching, and rolling of the muscles have much greater influence in stimulating their nutrition and contractility than stroking, which acts more upon the superficial circulation.

Dr. Landerer next uses manœuvres which act more especially upon the skeleton, the spinal column and the framework of the chest—the *redressement*. These resemble rotation and torsion movements, which have hitherto played an important part in the treatment of scoliosis. After this the spinous processes are acted upon by stroking from behind up-

wards, and by pushing them directly towards the concave side so as to equalize the curves. The immediate effect of this is quite perceptible. Then the depressed parts of the thorax are raised by one hand gliding from the anterior aspect of the chest backwards, raising the concave side, whilst the other presses down the projecting parts in the convex side by stroking with pressure from the spinal column forwards around the chest; and thus the youngster is literally remodeled. Prominences elsewhere, as under the scapula, receive special attention. Sometimes these operations can be done better whilst the patient stands or bends forwards. For special exercise of the extensors of the back, the patient is placed and fixed upon the anterior aspect of his legs on a table or couch, the body projecting beyond the edge and sufficiently supported. Then the patient elevates the trunk from the horizontal position backwards as far as possible by energetic contraction of the extensors, assisted if necessary. To finish the *séance*, the patients are allowed to suspend themselves for five or ten minutes by means of Sayre's apparatus*—the hand corresponding to the lower shoulder should then be the higher. After treatment has thus been continued for a few weeks, active exercise is allowed by means of a basket carried upon the head with a weight of 3

* This is said to have been first devised by Dr. Benjamin Lee, of Philadelphia.

to 5 kilos in it, which is supported by the hand of the depressed side. This treatment is usually given once daily, but in difficult cases, or where speedy cure is desired, it may be used twice daily.

Whilst the patient is suspended, I have found it advantageous to manipulate, roll, and percuss the muscles of the back. Other well known beneficial aids, not spoken of by Landerer, are: rowing, sitting on an inclined plane with the higher shoulder pointing toward the higher end, so that the patient must bend sideways in this direction and thus make a constant effort to keep from sliding off. Placing the arm of the side that corresponds to the convex dorsal curve, across the front of the chest in an upward direction so as to relax the *serratus magnus* and *rhomboidei* muscles, whilst the arm of the opposite side is placed obliquely downwards behind the back so as to make the muscles of this side tense, forms a useful exercise by literally unscrewing the patient. With the arms in a similar position, the patient sitting on an inclined plane can pull elastic bands and get still more effect, as advised by Prof. Sayre. Another useful exercise can be taken by putting the hand of the depressed side on the head, pressing the other upon the prominent side of the chest, and then respiring slowly and deeply.

Malgaigne long ago styled massage the soul of orthopædic surgery.

FLEXION AND EXTENSION *versus* SUSPENSION IN LOCOMOTOR ATAXIA.

There seems to be no doubt as to the benefit that locomotor ataxic patients derive from suspension by the head and axillæ. This is nothing more nor less than an attempt at massage of the spinal cord itself; and so good an observer as Lauder Brunton considers that it acts in the same way as massage does on the external tissues of the body. The spinal nerve-roots must receive some stretching, and this doubtless has an influence on the cord. The vertebral column is elongated from 2½ to 4 centimeters (1 to 1.6 inches); its muscles and ligaments are stretched. But this is accompanied by great danger in some cases. The same object can be attained much more safely and effectually by making extension and counter-extension at both the head and feet simultaneously, with the patient in a horizontal position, or even on an inclined plane.

Suspension from the elbows by the sides can act only upon the muscles of the trunk and chest, and in the same proportion take it off the spinal column, if suspension by the head be used at the same time.

A better and more efficacious way than any of these is by passive and active flexion and extension of the trunk, preceded and followed by massage. For accomplishing this, every physician may have his method, called after his name, according to the skill

and ingenuity he may display. The experiments of Hegar* throw much light on this subject, and are regarded as the most satisfactory. He laid bare the dura mater of the spinal cord in the dorsal region, and inserted into it two bright threads at a distance of 12.5 centimeters from each other, the cadaver being in a horizontal position, back uppermost. Moderate flexion, produced by placing blocks under the chest and abdomen and bending the neck, the legs being free, made the distance between the threads 13 centimeters, an increase of 5 millimeters. Strong flexion in the same manner made the distance 13.2 centimeters, a gain of 7 milllmeters in all. This was increased only 1 millimeter more by flexing the thighs upon the abdomen, with the knees extended. The cadaver was then placed flat, as at first, and the distance between the threads became 12.5 centimeters, as before.

Both sciatic nerves were then laid bare, and a strong pull made upon them, which only increased the distance between the threads one millimeter. The spinal column was again flexed, and the distance measured 13.1 centimeters, an increase of 6 millimeters; and in this position the sciatic nerves were strongly pulled, and the distance became 13.3 centimeters, a gain of 8 millimeters in all.

The next question to determine was whether the spinal cord itself partook in the extension. The dura

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*Wiener Med. Blætter, 1884, No. 3.

mater was opened and two threads stitched into the substance of the cord, at a distance of 15.35 centimeters from each other. Upon moderate flexion this became 16.1 centimeters, and upon strong flexion 16.4 centimeters. Hence we arrive at the very interesting conclusion that the cord itself allows greater extension than does its dura mater. Division of both sciatic nerves made no difference upon the result.

By means of forcible, bloodless stretching of nerve trunks, Cattani obtained the same results as by bloody stretching: tearing of the axis cylinder, stretching of the medullary sheath, with subsequent degeneration and regeneration.

We have every reason to suppose that stretching and relaxing of nerve filaments, nerve trunks, and even the spinal cord itself, are as essential for their proper circulation and nourishment as muscular contraction and relaxation are for the nutrition and welfare of the muscles. But, of course, even this feature might be carried to excess.

MASSAGE OF THE EAR—AN IMPROVEMENT ON HOMMEL'S TRAGUS PRESSURE.

The Archives of Otology for 1886 tell us that Hommel has discarded the usual methods of mechanical treatment of the membrana tympani and ossicles, and advocates a new method which he calls *Tragus Press.* Acting upon the supposition that pressure of the tragus upon the meatus renders the canal air-

tight, and condenses the air therein sufficiently to act directly upon the membrana tympani, he releases the pressure upon the tragus, that the sudden escape of the compressed air may produce a vacuum and traction upon the membrane; compression and attraction of the membrane being thus rapidly produced by exerting and relaxing pressure upon the tragus. Hommel suffered from chronic catarrh of the middle ear; and experimenting in this way upon himself, he found that his hearing improved in several months from 10 and 40 centimeters for the watch to 150 and 610 centimeters. A similar result was obtained in a boy who suffered from a perforation on one side and thickening and retraction of the membrane on the other. Prior to this mode of treatment the watch was heard only at 5 centimeters by the left ear and 12 by the right. After nine months of treatment the hearing had improved to 160 and 340 centimeters, respectively. Hommel advises this sort of treatment in chronic catarrh of the middle ear; in perforations of the membrane, the handle of the hammer still being in connection with the membrane; in thickening and opacities of the membrane; and as a prophylactic against deafness developing in old age.

In the United States this treatment is usually relegated to the patients themselves, and in the above-named conditions it is not likely that they could make themselves any worse. But harm has been reported as a result of this procedure, and if any one will have

it tried on his own well ears he will find considerable discomfort therefrom suggestive of mischief if kept up. A much more agreeable and efficacious method than that of Hommel is, to apply the hand so that the muscles in front of the metacarpal bone of the thumb will fit accurately into and over the auricle, the right hand for the left ear, and left for the right, and by making moderately strong, circular kneading in a direction backwards, upwards, and outwards, powerful but pleasant compression and suction are created, sensible to the hand of the operator as well as to the ear of the patient. This has none of the disagreeable feeling of "plop, plop, plop," like shooting peas into the ear, which the "tragus-press" of Hommel has. Indeed, Hommel's method makes no suction at all (except in theory), for the compression of air which it causes is so slight that its sudden liberation cannot produce any appreciable vacuum as claimed by its advocates. That benefit has resulted from it, there is no doubt, but we must look for a reason other than that given, and it is undoubtedly this: that, the vessels of the cavity of the tympanum and the drum membrane anastamosing at the tragus, alternate compression and relaxation of the tragus produces a pump-like action on these vessels, which draws the blood outwards, thus making the circulation go on more lively, bringing more nutritive material and removing more waste products, as massage does in any other part of the body. But the more agreeable method which I

advocate possesses the same advantages also, besides affording very decided compression and suction of air in the external auditory canal.

When desired, the auricle can be grasped at the same time by the fingers behind it and the muscles at the base of the thumb in front, and circular traction made with the strongest pull exerted upwards, backwards, and outwards; but this does not afford so much compression and suction as when the auricle is not grasped. These procedures can be advantageously varied, and their effect increased by effleurage or stroking in front of the ear and on the side of the neck, which rapidly aids the return of the blood in the temporal vein and jugulars, and hastens the flow in the lymphatic vessels at the same time, and thus depletes not only the ear, but the whole head as well. Passive and resistive movements of the head would also quicken the circulation of this region. The head and face may also be *masséed* at the same sitting, which, besides the revulsive effect, will also have a sedative influence by means of the communication of the fifth pair of nerves with the otic ganglion.

Any or all these manœuvres may be attempted by patients on themselves, but unless their efforts are supplemented by those of an experienced manipulator they will find them about as effectual as if they attempted to lift themselves over a fence by the straps of their boots, for action and reaction are equal and

opposite. Just when they should be used and when not, we leave to the aurists to decide.

None of the procedures I have referred to are the same as that made use of by Dr. E. D. Spear for the removal of a foreign body from the auditory meatus. Here are his own words: "When a foreign body has been placed within the auditory meatus, and no attempts at its removal have been made, it will often be found in the cartilaginous portion of the canal, and impinging on the wall near its outer end. If the fingers are now pressed firmly upon the skin close to and in front of the tragus, carried upward and around the meatus upon the auricle, and back again to their starting-point, then lifted up, the manœuvres repeated several times, the foreign body will be seen to move outwards, and finally drop into the depression at the bottom of the concha."

CHAPTER XI.

MASSAGE OF THE EYES:—MASSAGE SIMPLE, MASSAGE MEDICAL, MASSAGE TRAUMATIQUE, FOR GRANULATIONS, FOR CHRONIC INFLAMMATORY PROCESSES OF THE ANTERIOR SEGMENT OF THE EYE, FOR EMBOLISM OF THE CENTRAL ARTERY OF THE RETINA, FOR CATARACT, ETC.

I have elsewhere referred to the benefits of massage of the eyelids, face, and head, after the failure of other means, in cases of muscular asthenopia (fatigue of sight) occurring in near-sighted, far-sighted, and astigmatic eyes. Of late I have had some still more interesting experience in the relief of headache by means of massage, in a patient who at times is markedly neurasthenic, the origin of which condition dates from an injury received twelve years ago. His headache is precipitated by overwork, worry, or slight indigestion, and incapacitates him from business. Half an hour's massage of head and back completely relieves the headache, and one or two repetitions of the same treatment *wind him up* so that he can run for weeks or months and work with ease. He has recently consulted an oculist, who found him astig-

matic and gave him suitable glasses, which are an immense comfort to him; but still the headaches occur as before, and are as promptly relieved by massage.

Elsewhere I have published the favorable experience of European oculists, especially that of Dr. Pagenstecker, in the use of massage upon chronic inflammatory processes of the anterior segment of the eye, in opacities of the cornea, in some forms of chronic conjunctivitis and of scleritis and episcleritis, etc. Much interesting testimony has recently been added to this, from various sources, by Dr. Jocqs, in the Revue d'Hygiene Thérapeutique, December, 1891, which seems worth mentioning here. Ocular massage is very neatly divided into three categories:

1. *Massage Simple*, which is done by moving the lids, under slight pressure, in a radial direction away from the centre of the cornea, and by circular friction, under slight pressure upon the upper lid, around the sclero-corneal margin and adjacent surfaces. This is the method of Pagenstecker, and has the effect of pushing along the current in the blood-vessels and lymphatics at the sclero-corneal margin and promoting absorption of any exudation around them. It is employed to aid resorption in œdema, and also in conjunctival ecchymoses, idiopathic or traumatic. Referring to four cases recently published, massage would seem to have proved very useful in embolism of the central artery of the retina. The case of Vood White

was that of a man blind in the right eye from embolism of the central artery of the retina. Several hours after pressure upon the globe, the retinal vessels refilled with blood, and in two days sight was re-established. In one case reported by Dr. Miles, in another by Hirschberg, and in a third by Hilbert, the troubles due to embolism of the central artery of the retina were rapidly dispelled in consequence of frictions and pressure upon the globe of the eye. The return of the circulation in the retinal vessels was confirmed by the ophthalmoscope.

Blepharospasm has been found to yield kindly to massage.

2. *Massage Medicated* is done in the same manner as Massage Simple of the eye, with the addition of lotions or ointments introduced inside the lids. These are much more quickly and completely absorbed under massage than without it, and produce more salutary effects. *Conjunctivitis* and *kerato-conjunctivitis phlyctenular* are said to be quickly cured in this manner, using a weak ointment of yellow oxide of mercury. Massage is also extolled for its effects in ulcers of the cornea. Anæsthesia should first be obtained by means of cocaine, and the massage can be employed through the lid without producing any pain. This has the effect of cleansing the surface of the ulcer, freeing it from the greyish detritus which covers it, and liberating its edges from the detached film under which may be concealed numerous colon-

ies of bacteria. Then the ulcer will be in a better state for the application of antiseptics.

In *interstitial keratitis*, massage with yellow ointment often hastens the cure by causing the absorption of the mercury directly by the kerato-conjunctival surface. This increased absorption produced by massage has been verified in the following case: A woman came to consult Dr. Jocqs for an *iritis à hypopyon.* Together with the instillation of atropine, a prolonged massage of the eye with iodoform ointment was used every day. The hypopyon rapidly got well, but after some days of this treatment there supervened an erythematous eruption over all the body which was characteristic of that produced by the absorption of iodoform. In order that there should be no doubt, she was sent to the Hospital St. Louis, where this diagnosis was confirmed.

3. *Massage Traumatique* is as near like rubbing the inside of the lids with sand-paper as can be imagined. It is used for granulations of the conjunctiva and opacities of the cornea. The conjunctiva is at first rendered insensitive by means of cocaine. A finger or thumb is then rendered antiseptic in a solution of corrosive sublimate, and after this it is dipped into some finely pulverized boracic acid. The lid is then turned up or down, and the massage is as strong as can be tolerated for two or three minutes. A profuse flow of blood is occasioned thereby, but very soon, in place of the rugous surface which was

felt at first, there is a smooth and soft surface, showing that the granulations have been rubbed off. During the sitting the finger is often dipped into the boracic acid powder. The massage is stopped as soon as the patient begins to suffer. The bleeding surface is bathed in a weak solution of corrosive sublimate; and when the bleeding stops, the lids can remain open without difficulty. The reaction which follows is almost *nil*. This procedure can be repeated every two days, and twenty sittings usually suffice. This is the method of Dr. Costomiris, of Athens, and many other oculists are said to have adopted it with success. Quite recently Dr. Sattler and others have employed scraping off the granulations with a hard brush and washing with a strong solution of corrosive sublimate. A somewhat similar method is said to have been employed by the ancients. The digital massage would seem to be preferable.

At the French Congress of Ophthalmology in 1888, Dr. Vignes presented a "beautiful" case of cure of trachoma complicated with pannus, by means of massage with boracic acid.

Massage of the cornea is employed to cause the disappearance of specks. It may be used directly upon the cornea or through the lids, with any sort of slightly irritating fine powder; calomel is usually employed. There is everything to be hoped for when the specks are superficial and recent, but when the opacity is milky white it indicates a certain thickness

of the cicatricial tissue, and then massage would be useless.

Massage has been used to hasten the ripening of cataract in some cases, and also to promote absorption of cataract in others, thus showing that the same thing has not always the same effects. Forster's method consists in rubbing the cornea against the lens with a small blunt instrument, after first making an iridectomy. As a result of this manipulation the lens undergoes a rapid degeneration, and in the course of a few weeks becomes completely opaque and suitable for removal. This requires skill and judgment, so as not to do too much nor too little. Another method, spoken of as intra-ocular massage of the lens, is done by introducing into the anterior chamber a small spatula with which the surface of the lens is gently rubbed. The result of this, we are told, is that in a few days there is an increased opacity, and in the course of a few weeks at the longest the cataract is ready for extraction. This is said to be more accurate, less likely to wound the iris, and more certain in its action, than the preceding method. The object of these procedures is to hasten the opacity of the lens, so that it will be loosened from its capsule, and be easily extruded when the capsule is divided, like the kernel of a cracked nut when ripe.

In 1890 Dr. Richard Kalish, ophthalmic surgeon to Charity Hospital, New York, published an inter-

esting paper in the Medical Record on "Arrest and Partial Resorption of Immature Cataract, with Restoration of Reading Power." The problems and solutions which he proposed were: 1. Since non-traumatic cataract depends upon an interference with, or deficient nourishment of, the lens, how can an additional supply of nutritive material be furnished to the intra-ocular structures? The most feasible answer to this seemed to be, by properly applied manipulation so as to bring about an increased blood-supply. 2. How can a remedy with solvent or discutient powers be brought into relation with the lens so as to cause absorption or dissipation of the opacity? This was answered by a method of conjoined instillation and manipulation. The mixture for instillation consists of equal parts of glycerin, and a one-per-cent. solution of boric acid in rose-water. If this causes too much irritation, which lasts longer than five to twenty seconds, the proportion of glycerin is reduced; but if no irritation be caused, the glycerin is increased to double the quantity of the rose-water solution. In only one case was it possible to employ more than three instillations at a single sitting. After the first, each successive instillation generally causes more smarting. With this, manipulation is employed. The patient is seated in a chair with a back high enough to support the head. Two drops of the solution are put into each eye; and the operator, standing or sitting behind the patient, places the tip of each middle finger over the closed

lids so that it rests upon the eyeball at its nasal side. With slight pressure the fingers are drawn outward over the eye to the temporal side. This is repeated twenty or thirty times a minute, the stroking being in one direction only and continued for ten minutes, when a second instillation of two drops is made into each eye, and manipulation done as before for ten minntes; then two drops more are put into each eye, and manipulation again used for ten minutes. This is not fatiguing to the manipulator, if the head of the patient be so placed that the arms of the manipulator can rest upon the top of the chair. This treatment should be used daily for a week, and after this the instillations should be made every fifteen minutes, so that a sitting will last for three-quarters of an hour. After a treatment, the solution is wiped from the face by cloths wrung out of warm water; this has the effect of cooling the lids by evaporation. Should the heat of the lids persist, the patient should remain until they are cool. Manipulation alone was tried, without improvement. Instillation of various substances was also tried, with no improvement; but the combination mentioned was successful. The first effect is a marked softening of the eyeball, and for the first few days the patients complain of tenderness of the eyeball after the treatment, but this usually ceases at the end of a week. Considerable injection of the conjunctiva is also caused, but this is slight and temporary. Dr. Kalish treated a number of cases

in this way, and arrived at the following conclusions.

1. Cases of immature, uncomplicated cataract can be permanently benefited.

2. The reading power can be restored.

3. This treatment should be used daily, Sundays excepted, for two, three, or four months, and at the first notice of no benefit or of diminution of sight it should be discontinued. It is needless to say that the treatment should be under the supervision of an oculist who will examine the eyes and keep an accurate record of the result.

I have known cataracts to be improved by massage of the eyelids, face, and head, without any manipulation at all of the eyeball. As spontaneous cure of cataract is well known to have taken place, though it is of rare occurrence, the fact should lead us to hope for some mild means of aiding nature's efforts in the way of recovery. Spontaneous recoveries are generally indications that nature can be artificially aided. While waiting for the necessity of an operation, massage would be a harmless and luxurious experiment, and if the patient would be responsible for the want of result it might be justifiable. The instances in which cataracts improve for a time, or disappear of their own accord, are so exceedingly rare, that should improvement or recovery follow massage it would be just ground for encouragement from this source.

Mr. Higgins, at a recent meeting of the Ophthalmological Society in London, brought forward the case of a man 57 years old, who ten years before had a mature cataract in his right eye, but whose left was sound. For eight and a half years the man had only perception of light in his right eye, but after this time the sight gradually improved so that he could with suitable glasses see $\frac{6}{36}$ and J .10 with difficulty. There was much opaque capsule still left, but the lens had undergone almost complete absorption. No treatment was used. Another case of spontaneous cure of cataract has been reported by Dr. Robinson, in an older patient in whom the sight suddenly improved so that after seven years of blindness from cataract she was able to read large type in a good light. Dr. Robinson suggests that this advanced stage of Morgagnian cataract may be what is popularly called "second sight" (Therapeutic Gazette, 1892).

As old Admiral Henry illustrates nearly all the virtues of massage referred to in the preceding pages, it seems fitting that we should close with a brief account of him and the crude sort of massage that he employed so successfully upon himself. Admiral John Henry was born at Holyhead, in the Island of Anglesea, in 1731. He entered the British Navy in 1744, in which he served during the whole of the American war, and, in consequence of his success in taking Mud Island in the Delaware in 1779, he was promoted to the rank of Captain by Admiral Howe. He was also

in the war with France in 1793. From 1782 to 1810, twenty-eight years, the Admiral had suffered from rheumatism which caused swellings in nearly all his joints and made his muscles stiff and painful, so that he was at times very lame, at others better. In 1810 he began perseveringly to rub and knead his joints and muscles, his tendons and nerves, with instruments of his own device, which were the ends of bone polished smooth, and the ends of glass vials; and he percussed himself with a metallic hammer faced with cork. He kept this up night and morning for three years, and succeeded in removing the swellings, pain, and stiffness, and so recovered the use of his limbs. His stomach and bowels had long been in a bad state; hard, painful, disordered. By working them with a bone, rounded at the end, in each hand, digging in and making the two bones meet as much as possible, the stomach became so strong that it could digest anything, and the bowels regular. He considered one alvine movement a week quite sufficie. . though he was often troubled by more frequent dejections after he began to use his instruments. The whole head, inside and out, as much as possible, was subjected to the same vigorous treatment, and the throat did not escape. The Admiral found these procedures to be at first painful; but when persevered in they ceased to hurt, and became pleasant and so beneficial that after his morning treatment he felt better all day. The old fellow's pathology is quaint and curious, and

contains much common-sense. In his opinion, "the chief cause of disease is deficiency of circulation; and the best means of correcting it, is to prevent the tendons and nerves from falling asleep or getting fixed; for which purpose they should be kept quite loose by instruments worked among them. By keeping the blood-vessels, nerves, and tendons in constant action, the blood is rendered pure; it passes quickly through the blood-vessels, leaving no *fur* behind it, so that ossification, which so frequently terminates the human existence, is prevented." This *fur* of Admiral Henry would correspond well to what we now know of the waste materials and of the white blood-corpuscles and their behavior.

In 1782 a cataract began to form in Admiral Henry's left eye. He was accidentally led to rub it over the closed lids with the joint of his thumb, and thought that the eye was the better for it. In hopes of dispersing the cataract, he then began to use the round end of a glass vial, and some time after he perceived more light. He continued this plan, and in less than two years the cataract was dispersed. Two years later a cataract came in the other eye. It was operated upon by a skillful oculist, and he lost the sight of it—but retained the use of the other. About three months after this he was seized with *tic douloureux* in the eye that had been operated upon, so that he had two fits a day, of three or four hours' duration each, during which the lids were closed tight

and there was great pain. Hemlock in large quantities and a seton at the lack of the neck afforded relief for a time, but the trouble returned as bad as ever. He tried scraping the upper lid with a piece of silver, and this is said to have completely removed the complaint. Scraping had been previously tried around the temple without benefit. In the same way he cured himself of corns, chilblains, and cramps, and Lord knows what else. His testicles, which were small from age, became, in consequence of his rubbing them with bones and glass vials, as large as ever they had been. If the glass vials had broken in this region, it would probably have put a sudden stop to his enthusiasm. On March 1, 1823, when 92 years of age, he wrote to a friend: "I never was better, and at present am likely to continue so. I step up and down stairs with an ease which surprises myself. As to gout and similar complaints, they dare not approach. I have gone through every disorder that man can go through but plague and fever, and here I am in very good condition. I eat and drink heartily, my digestion is excellent, and every food agrees with me. I can walk three miles to Tenterden without stopping." It is but recently that I learned of the Admiral's death; for his biographer,* in his enthusiasm, has forgotten to mention this apparently trivial occurrence. It occurred in 1829, at the age of 98 years.

* Sir John Sinclair: Code of Health and Longevity.

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